



Message from

**VICE CHANCELLOR**  
**ANNA UNIVERSITY**

**I**t is a matter of pride that the Department of Mechanical Engineering is organizing the 16<sup>th</sup> International Vacuum Insulation Symposium 2023 (IVIS2023) during November 6–7, 2023 and I am very happy to welcome you all to our esteemed institution. The symposium theme is highly relevant, focusing on Energy and Environment, which are top priorities on the G20 agenda. Vacuum Insulation Panels (VIPs) have revolutionized the way we address insulation challenges in various domains, such as buildings, cold chain systems, transportation, the healthcare sector, and more. The versatility of VIPs in these applications demonstrates their potential to reduce energy consumption and minimize environmental impact.

I am delighted that leading experts, researchers, and industry professionals from around the world will be participating in the symposium to discuss the remarkable advancements and challenges in the field of VIPs.

I hope this symposium will provide a platform for exchanging ideas and transforming concepts into sustainable solutions for the betterment of society at large. I wish the 16<sup>th</sup> edition of IVIS2023 great success.

**Prof R Velraj**

## Message from the **CHAIR**

On behalf of the College of Engineering, Guindy, I would like to extend a warm welcome to you in Chennai for the 16<sup>th</sup> International Vacuum Insulation Symposium 2023 (IVIS2023). This symposium offers a unique platform for participants from both academia and industry to explore into the latest advancements and applications of Vacuum Insulation Panels (VIPs). We are confident that our collaborative efforts and the exchange of knowledge will yield groundbreaking insights that contribute to sustainable progress.



I would also like to take this moment to express our gratitude to the scientific committee for their diligent review of the abstracts and their selection of the best papers that align with the symposium's theme.

I hope that IVIS2023 will prove to be a productive, informative, and enjoyable experience for you. Furthermore, I wish you a pleasant stay in Chennai and eagerly anticipate your constructive feedback, which will aid us in our future endeavours.

**Prof G Kumaresan**  
Anna University

## Message from the **TECHNICAL CHAIR**

It is my great pleasure to welcome you to the Symposium on Vacuum Insulation Panels. We are thrilled to have you join us for this exciting event, where we will explore the latest developments and innovations in the field of vacuum insulation panels. This symposium has been meticulously designed to bring together researchers, engineers, industry professionals, and experts from various corners of the globe. Our distinguished keynote speakers and presenters will share their knowledge and expertise, shedding light on the most recent advancements in this field.



This symposium is a unique opportunity for us to come together and delve into the world of vacuum insulation panels. Over the next few days, we will have the chance to explore the latest breakthroughs, share knowledge, and discuss the challenges and opportunities that lie ahead in this field.

We are looking forward to your active participation, valuable contributions, and the success of this event. Let us collectively push the boundaries of knowledge in this exciting field and pave the way for a more sustainable future.

**Prof S Suresh**  
NIT- Tiruchirapalli

## KEYNOTE SPEAKERS

**Dr Roland Caps**, Co-founder, va-Q-tec AG

» *Cost Efficiency of VIPs*



Roland Caps completed his diploma (1982) and doctoral research (1985) in Physics from University of Würzburg, Germany. The topic of his thesis was thermal radiation in evacuated thermal insulation. He held research positions at University of Würzburg (1988) and at the research institute Hohenstein on heat and moisture transfer in clothing (1992) after which he was appointed the head of department “Thermal Insulation and Heat Transfer” of the Bavarian Institute of Applied Energy Research in Würzburg (1992– 2001). Dr. Caps co-founded va-Q-tec AG in Würzburg in 2001 where he served as the Chief Research Officer until 2017.

**Mr Sebastian Baars**, CEO, Vaku-Isotherm GmbH

*Update on VIPA International* «

Sebastian Baars is the President of Vacuum Insulation Panel Association (VIPA International) since 2020 and CEO of Vaku-Isotherm since more than 6 years. Prior to his role at Vaku-Isotherm he worked for several medical device manufacturers where he managed the Industrial Engineering and Maintenance teams. Sebastian graduated from the Technical University in Munich with a Master of Science degree.



**Prof Zhaofeng Chen**, Nanjing University of Aeronautics and Astronautics

» *New material and New structure development of VIPs in China from 2021-2023*



Chen has been engaged in the research of super insulation materials and technologies. He has undertaken more than 20 projects funded by the National Natural Science Foundation of China, international science and technology cooperation projects of the Ministry of Science and Technology and provincial projects, and has trained more than 20 doctoral students, more than 80 master students and 6 bachelor students.

## KEYNOTE SPEAKERS

**Mr Vinay W Chalniwale**, Senior Manager, Whirlpool of India Ltd.

» *Vacuum Insulation Panels (VIPs) in Indian Refrigerator Sector: Overview*



Vinay Chalniwale, a chemical engineer, has been working with Whirlpool Corporation for more than two decades, in the field of materials technology. He is currently responsible for overseeing the selection and performance of materials used in the production of the company's products. He ensures that all materials and processing technology meet regulatory compliance and quality and sustainability standards. His expertise lies in the areas of Polyurethane foaming and Polymers. He has earned his Masters in Industrial Material Science and Chemistry from Savitribai Phule Pune University, Pune, India.

**Dr Antonio J Aldykiewicz Jr**, Senior R&D staff, ORNL

*The development and deployment of vacuum insulation panels in buildings* ◀

Antonio J Aldykiewicz Jr is a Senior R&D Staff Member with the Building Envelope Materials Research Group at Oak Ridge National Laboratory (ORNL) in the USA. He has a background in materials science and engineering with over 20 years of industrial experience working on the development and deployment of materials & systems for residential and commercial construction in the space of cement and concrete technologies, below-grade waterproofing, air and vapor barrier products, insulation, and fire protection materials and holds several patents in these fields. His current research is focused on the development of materials and systems to improve energy performance, durability, fire performance, and sustainability of the building enclosure in new and existing construction.



# International Vacuum Insulation Symposium 2023 | 6<sup>th</sup> November 2023

<b>REGISTRATION</b>	08:00 - 08:55
Welcome address <b>Prof G Kumaresan (Chair IVIS2023)</b>	09:00 - 09:05
Inaugural address <b>Prof R Velraj (Vice Chancellor)</b>	09:05 - 09:15
Chief Guest address <b>Dr E S Padma Kumar</b> Indian Space Research Organization Inertial Systems Unit (ISU)	09:15 - 09:30
Vote of thanks <b>Prof S Suresh (Technical Chair IVIS2023)</b>	09:30 - 09:35
Update on VIPA International <b>Mr Sebastian Baars</b>	09:35 - 09:55
Cost Efficiency of VIPs <b>Dr Roland Caps</b>	09:55 - 10:15
The development and deployment of vacuum insulation panels in buildings <b>Dr Antonio J Aldykiewicz Jr</b>	10:15 - 10:35
<b>Break + Posters + Exhibition</b>	<b>10:35 - 11:05</b>
<b>Presentation session 1 Chair: Dr Roland Caps</b>	<b>11:05 - 12:05</b>
Slowing down the aging rate of VIPs in buildings – New Generation of PST Laminates <b>Diana Goldman</b>	11:05 - 11:25
VIP ageing, insight on 3D skeleton tortuosity with X-ray tomography analysis <b>Genevieve Foray</b>	11:25 - 11:45
Vacuum insulation panels (VIPs) for domestic cooking ovens <b>Dron Kaushik</b>	11:45 - 12:05
<b>Lunch + Posters + Exhibition + Scientific Committee Meeting</b>	<b>12:05 - 13:40</b>
<b>Presentation session 2 Chair: Prof Harjit Singh</b>	<b>13:40 - 14:40</b>
Development of novel barrier technology with VM-EVOH <b>Yasuhiro Nonaka</b>	13:40 - 14:00
Properties of Cabin Interiors with Integrated Vacuum Insulation Panels <b>Vakhtang Latsuzbaya (Online)</b>	14:00 - 14:20
Differences and Challenges of Long-Term Performance Prediction Methods for Glass-Fiber-Core Vacuum Insulation Panels Including Getters <b>Hideya Yamamoto</b>	14:20 - 14:40

<b>Break + Posters + Exhibition</b>	<b>14:40 - 15:10</b>
<b>Presentation session 3 Chair: Prof S Suresh</b>	<b>15:10 - 16:10</b>
Influence of Dynamic Vacuum Insulation (DVI) on Energy Performance of Buildings in Canada <b>Phalguni Mukhopadhyaya</b>	15:10 - 15:30
Validated Model for Mie Scattering of Thermal Radiation in Vacuum Insulation Panel Cores <b>Mohammed Reza Jalali</b>	15:30 - 15:50
Use of Energy Storage and Vacuum Insulation Panels for Energy Efficient Buildings in India <b>Himanshu Tyagi</b>	15:50 - 16:10
<b>IVIS Awards Presentation</b>	<b>16:10 - 16:40</b>
<b>Symposium Dinner</b>	<b>19:00</b>

## International Vacuum Insulation Symposium 2023 | 7<sup>th</sup> November 2023

Vacuum Insulation Panels (VIPs) in Indian Refrigerator Sector: Overview <b>Mr Vinay W Chalniwale</b>	09:00 - 09:20
New material and New structure development of VIPs in China from 2021-2023 <b>Prof Zhaofeng Chen (Online)</b>	09:20 - 09:40
<b>Presentation session 4 Chair : Dr Stefano Fantucci</b>	<b>09:40 - 10:40</b>
Date Palm Fiber as core material for Vacuum Insulation Panels for Car Painting Booths operating at 70°C <b>Tarek Raad</b>	09:40 - 10:00
Thermal evaluation of Vacuum Insulation Panels with Recycled cellulose based core material <b>Mahmood Alam (Online)</b>	10:00 - 10:20
Various installation examples of vacuum insulation panel for buildings <b>Ji Sun Han</b>	10:20 - 10:40
<b>Break + Posters + Exhibition</b>	<b>10:40 - 11:10</b>

<b>Presentation session 5</b> Chair: Prof Phalguni Mukhopadhyaya	<b>11:10 – 12:10</b>
Energy Characteristics for Building Space Heating using a Concrete Energy Storage System <b>Manoj Kumar</b>	11:10 - 11:30
Thermal and Acoustic performance of super insulated façade spandrel modules embedding Glass-Fiber Vacuum Panels <b>Stefano Fantucci</b>	11:30 - 11:50
Application of vacuum insulation panel for thermal protection of electronic thermal management system operating under hot air condition <b>S Suresh</b>	11:50 - 12:10
<b>Lunch + Posters + Exhibition</b>	<b>12:10 - 13:30</b>
<b>Presentation session 6</b> Chair: Dr Samuel Brunner	<b>13:30 – 14:50</b>
The Unified Dynamic Similitude Model Applied to Vacuum Insulation Panels <b>Oluwamayokun B Adetoro</b>	13:30 - 13:50
Prediction of VIP life by Arrhenius formula <b>Zhaofeng Chen (Online)</b>	13:50 - 14:10
Long-term Performance of VIPs in Refrigerated Shipping Containers <b>Phalguni Mukhopadhyaya</b>	14:10 - 14:30
Energy Efficiency of Photovoltaic Thermal System using $Al_2O_3$ -Cu/Water as Hybrid Nanofluid: A Simulation Study <b>Prashant Kumar</b>	14:30 - 14:50
<b>Break + Posters + Exhibition</b>	<b>14:50 - 15:20</b>
<b>16<sup>th</sup> IVIS closure</b>	<b>15:20 – 16:00</b>
<b>Trip to DakshinaChitra Heritage Museum-Nov 8, 2023</b>	<b>09:00 – 13:00</b>

## ORGANIZING COMMITTEE

<b>Dr M Venkata Ramanan</b>	CEG, Anna University, Chennai, India
<b>Dr M R Swaminathan</b>	CEG, Anna University, Chennai, India
<b>Dr V Kumaresan</b>	CEG, Anna University, Chennai, India
<b>Dr D Ganesh</b>	CEG, Anna University, Chennai, India
<b>Dr K Thirumavalavan</b>	CEG, Anna University, Chennai, India

## SCIENTIFIC COMMITTEE

<b>Mr André Desjarlais</b>	Oak Ridge National Laboratory, USA
<b>Prof Atsushi Iwamae</b>	Kindai University, Japan
<b>Dr Bastian Büttner</b>	ZAE Bayern, Germany
<b>Dr Bijan Adl-Zarrabi</b>	Chalmers University of Technology, Sweden
<b>Dr Christoph Sprengard</b>	FIW Munich, Germany
<b>Dr Esra Kucukpınar</b>	Fraunhofer Institute for Process Engineering and Packaging, Germany
<b>Dr Genevieve Foray</b>	INSA-Lyon, France
<b>Dr Hans-Peter Ebert</b>	ZAE Bayern, Germany
<b>Dr Harjit Singh</b>	Brunel University London, UK
<b>Prof Jun-Tae Kim</b>	Kongju National University, South Korea
<b>Dr Karim Ghazi Wakili</b>	Institute for Applied Building Physics, Switzerland
<b>Dr G Kumaresan</b>	CEG, Anna University, Chennai, India
<b>Dr Mahmood Alam</b>	University of Brighton, United Kingdom
<b>Prof Marco Perino</b>	Politecnico di Torino – Denerg, Italy
<b>Dr Pär Johansson</b>	Chalmers University of Technology, Sweden
<b>Dr Phalguni Mukhopadhyaya</b>	University of Victoria, Canada
<b>Dr Samuel Brunner</b>	EMPA, Switzerland
<b>Dr Shahab Resalati</b>	Oxford Brookes University, United Kingdom
<b>Dr Stefano Fantucci</b>	Politecnico di Torino, Italy
<b>Dr S Suresh</b>	NIT Tiruchirappalli, India
<b>Dr Yoash Carmi</b>	Avery Dennison, Israel
<b>Dr Zhaofeng Chen</b>	Nanjing University of Aeronautics and Astronautics, China





# A GLOBAL TRADE ASSOCIATION REPRESENTING THE INTERESTS OF MANUFACTURERS OF VACUUM INSULATION PANELS AND THE SUPPLY CHAIN



## About Us

The Vacuum Insulation Panel Association (VIPA International) is a global trade association representing the interests of manufacturers of vacuum insulation panels, as well as the supply chain. The mission of the association is to act as the global voice of the vacuum insulation panel industry, promote quality and raise awareness about the potential of saving space and energy costs, and reducing carbon dioxide emissions in a wide range of applications and industries.

## Not a member yet?

VIPA International membership is open to manufacturers of Vacuum Insulation Panels (VIPs), as well as material and equipment suppliers, but also to companies with an interest in the VIP industry that do not fall into the previous categories. Academic institutions and non-profit associations with an interest in the VIP industry are also welcome to join the association.

## Membership & benefits

- **Drive Industry Progress:** Actively shape industry positions and initiatives within VIPA International and our working groups.
- **Stay Informed:** Gain exclusive access to industry resources, R&D studies and policy updates.
- **Share and Learn:** Collaborate with peers to exchange knowledge and best practices ensuring professional growth.
- **Expand Your Network:** Connect with high-level professionals and industry representatives.
- **Influence European Policy:** Join forces with VIPA International members to collectively influence decision-making in Europe, shaping the future of the VIP industry.
- **Get involved:** Play a role in defining the future of the association's strategic vision and positions.

*"VIPA International serves as the leading voice of the Vacuum Insulation Panel industry worldwide. Our association is dedicated to facilitating networking opportunities, promoting knowledge sharing, and influencing policy on a global scale"*

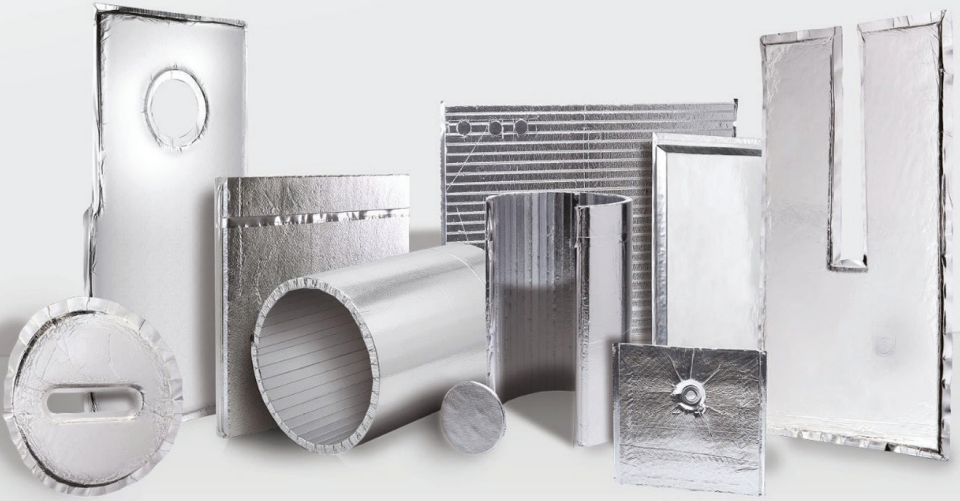
**SEBASTIAN BAARS**  
PRESIDENT, VIPA INTERNATIONAL  
CEO, VAKU-ISOTHERM



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# 20 years of experience & award- winning technology!

Vacuum Insulation Panels are our passion. va-Q-tec has already won numerous national and international awards for energy-efficient technologies based on this product. In order to keep the innovation lead, we invest a lot in research & development as well as in the commercialization of innovations.

va-Q-tec has the world's largest VIP product portfolio and more than fifty active international intellectual property rights, including the unique quality control va-Q-check®. In addition, va-Q-tec is regularly certified by TÜV SÜD in accordance with DIN EN ISO 9001, ISO 50001 and ISO 14001.

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