



TechCon 2024 Chicago

67th Annual SVC Technical Conference • May 4 – May 9, 2024
Chicago Hilton, Chicago, Illinois, USA



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Final Program and Exhibit Guide

**The Largest Expo and Conference
Dedicated to Vacuum Coating Technologies**

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J.A. Woollam

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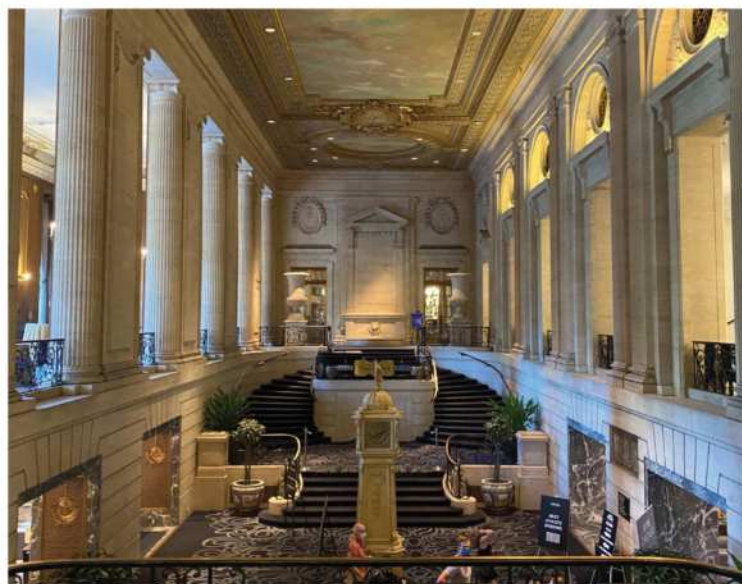
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About Our Venue

Chicago Hilton Hotel, Chicago, Illinois

The 2024 TechCon will be held at the Chicago Hilton Hotel in downtown Chicago, Illinois. Chicago shares the unique balance of having one of the world's most cosmopolitan cities coupled with the beautiful lakeside parks and beaches of Lake Michigan on the doorstep of the Great Lakes. Bursting with character and beauty, Chicago shines with its historic architecture, vibrant dining, stunning lake views, and endless entertainment.



The Windy City also offers renowned museums, theater, and entertainment options as well as parks, public beaches, and sports teams to cheer on. You can stroll along Navy Pier's boardwalk and experience cultural exhibits, live performances, fireworks, and lake cruises. Or, take a ride on the iconic Centennial Ferris Wheel to enjoy 360-degree views of the city and Lake Michigan. If you love the view from the top, try dining on the 95th floor of the John Hancock's Signature Room, walking on The Skydeck Ledge of Willis tower, or relaxing at a rooftop bar. Shopping and dining enthusiasts can take advantage of the great shops along Michigan Avenue and in the Gold Coast neighborhood, with everything from eclectic boutiques to luxury shops and Michelin Star dining options.

With so many year-round options, Chicago has it all to keep you coming back for more.

■ Chicago Hilton Hotel
720 S. Michigan Avenue
Chicago, IL 60605
312-922-4400



Exhibit Floor Plan

Exhibit Dates and Hours

Tuesday, May 7

1:00 p.m. to 6:00 p.m.

Wednesday, May 8

10:00 a.m. to 4:00 p.m.

Booth Set-Up Hours

Monday, May 6

1:00 p.m. to 6:00 p.m.

Tuesday, May 7

7:00 a.m. to 12:00 p.m.

Booth Tear-Down Hours

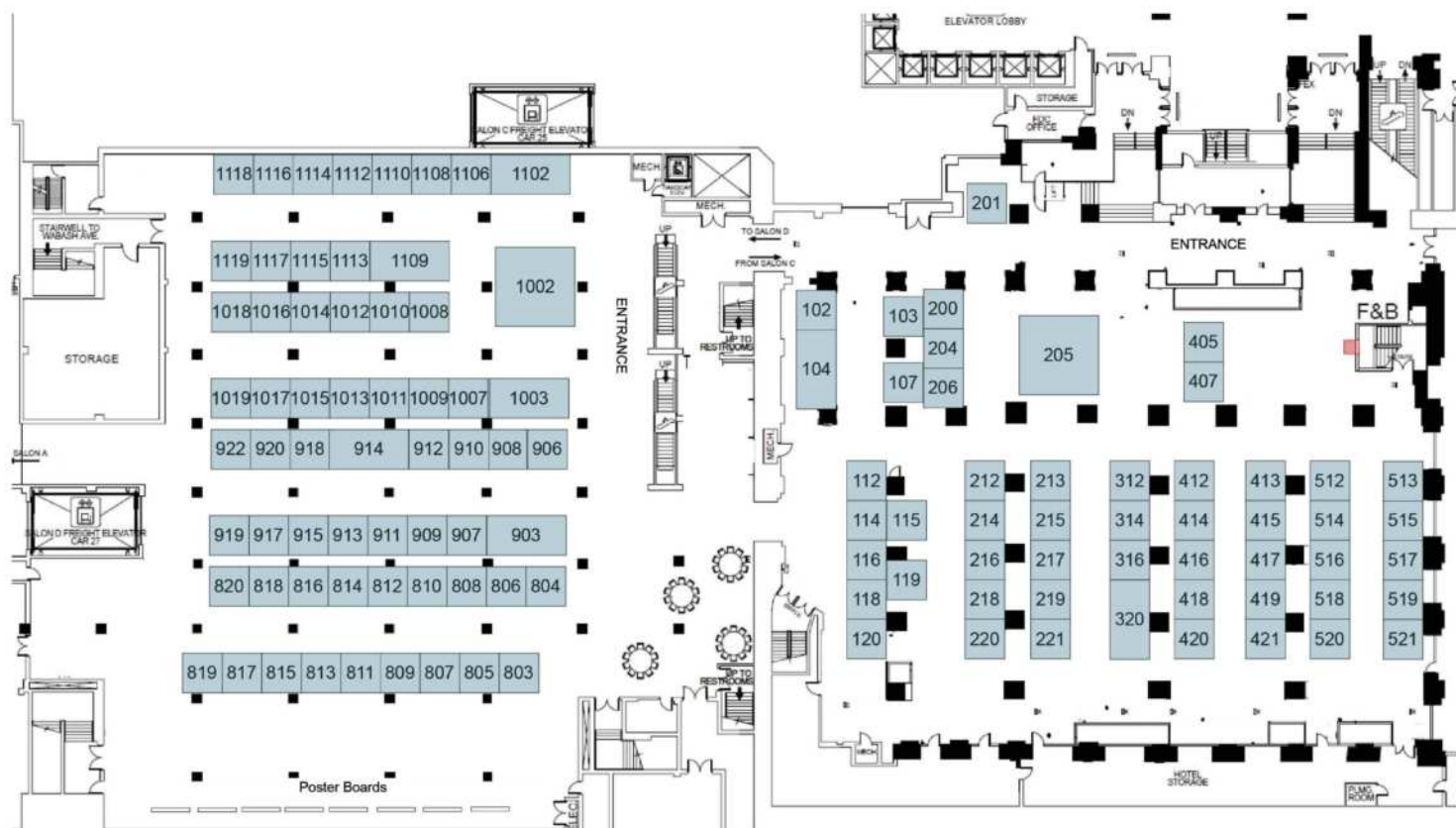
Wednesday, May 8

4:00 p.m. to 10:00 p.m.

Thursday, May 9

7:00 a.m. to 10:00 a.m.

Note: The Welcome Reception will be held on Tuesday, May 7, in the Exhibit Hall from 5:00 p.m. to 6:00 p.m.!



Networking Opportunities at the 2024 TechCon



Make Connections

The TechCon is packed with networking events designed to connect vacuum coating and surface engineering professionals with the global SVC community. Each technical and social networking event provides a different forum for invaluable face-to-face interactions and the opportunity to collaborate with technical experts.



Technology Forum Breakfasts

Vacuum coating technology spans multiple applications and processes. Join a discussion group focused on a topic that's important to you. Enjoy the conversation over breakfast before the start of the technical program Monday, Tuesday and Thursday.

To all of our SVC Stakeholders:

The **Technology Forum Breakfasts** have emerged as one of the most significant networking events at the TechCon. These breakfasts, held from 7:00 a.m. to 8:30 a.m. during the TechCon are "loosely" organized around a specific topic where we provide a moderator, a continental breakfast, plenty of seating, and an opportunity for free form discussion to take place. In the TFB's; problems are solved, new ideas are vetted, relationships are made and rekindled; all in the spirit of camaraderie that has made the SVC the most unique technical conference in our field. This year we are expanding the program even further and will offer more than 20 meetings during the TechCon. Please be sure to check the daily schedule (the TFB's are offered on Monday, Tuesday, and Thursday of the TechCon) to find those topics that interest you! And remember, we are always looking for new topics as well as moderators to get the discussion going in the mornings. Good luck and have fun!

– Frank Zimone, Executive Director



Exhibit Networking

Enjoy more opportunities than ever to visit the Exhibit Hall on May 7 – 8, 2024.

- Welcome Reception (held in Exhibit Hall)
5-6 p.m. on Tuesday, May 7
- Poster Session ■ Beer Blast

Additional Networking:

- Technical Program Keynote Presentations
- Exhibitor Innovator Showcase
- Roundtable Discussions

SVC Foundation Networking Events

CASINO NIGHT

Come and join us for an evening of fun and networking, all to help a great cause at the Fifth Annual SVC Foundation Casino Night on Monday, May 6, 2024, (8-10 p.m., International Ballroom South). *Additional Casino Night tickets can be purchased on-line during TechCon registration or at the TechCon. This is a wonderful opportunity to entertain friends and customers who may not be registered for the conference.*

RUN FOR A CAUSE!

Register for the Annual 5K Fun Run and support the scholarship efforts of the SVC Foundation. (Wednesday, May 8, 2024, bib pick-up at 5:30 a.m. in the Hilton Lobby)





2024 SVC Awards Ceremony and Welcome Reception

Date: **Tuesday, May 7, 2024**

Everyone is invited to attend

The **Awards Ceremony** will introduce and recognize the Nathaniel Sugerman Memorial Award recipient, SVC Mentor Award recipients, and Sponsored Student awardees. (8:40 - 9:20 a.m. Continental B Ballroom)

The **Welcome Reception** is a popular networking event at the TechCon. It offers a relaxed venue to meet friends and colleagues and provides the opportunity to make new connections before the start of the Technical Program. (5-6 p.m. in the Exhibit Hall)



2024 SVC TechCon Farewell Social

Date: **Thursday, May 9, 2024** (6-7:30 p.m., International Ballroom South)

Everyone is invited to attend

The **Farewell Social** will be the last networking event of the TechCon and will commemorate what promises to be the most successful TechCon yet! Come join us as we celebrate our Young Members and all the new connections that were made after a densely packed four day program.

Job Board

There will be a Job Board in the lobby adjacent to the TechCon registration desk. Open positions as well as resumes of those looking for a position can be posted. Messages for interested parties, either potential employer or employee, can also be posted on the board.



9:30 AM to 10:10 AM (Monday, May 6, 2024); Continental B Ballroom

Sustainability Inspired Design of HIPIMS Deposited Coating Materials

Jochen M. Schneider

Materials Chemistry, RWTH Aachen University, Germany

It is well known that HIPIMS offers control over ion energy and ion flux of coating forming species. This fact can be utilized to affect the defect structure and hence the coating properties. Here, coating material design approaches focusing on enhanced thermal stability and improved mechanical behavior are presented that utilize ion energy and ion flux to affect structural complexity. The implications thereof for sustainability are discussed. Furthermore, it is demonstrated that chemical complexity can be utilized to enhance the thermal stability of coatings, again in a sustainable fashion.

Both sustainability inspired design approaches are enabled by quantum mechanical predictions pertaining to phase formation, thermal stability and mechanical behavior. These causal relationships showcase material design opportunities in the context of sustainability.



Jochen M. Schneider, Ph.D., is Professor of Materials Chemistry at RWTH Aachen University, Germany. His research focus is quantum-mechanically guided design of thin films regarding thermal and chemical stability as well as elasticity. He also designs self-reporting materials.

Jochen was awarded the Sofya Kovalevskaya Prize by the Alexander von Humboldt Foundation for excellence in thin film materials science research in 2001 and was named a Fellow of American Vacuum Society (AVS) in 2013. In 2015 he was appointed as a Max Planck Fellow. Outstanding university professors at German universities are appointed by the Max Planck Society to address a scientific subject of common interest and to develop and lead a corresponding scientific research group. Also, in 2015 Jochen was named RWTH Fellow. In 2020 he was the Bill Sproul Award and Honorary ICMCTF Lecture Recipient; The Bill Sproul Award and Honorary ICMCTF lectureship is to recognize the achievements of a mid-career researcher who has made outstanding scientific and/or technological contributions in areas of interest to the Advanced Surface Engineering Division (ASED) of the AVS. In 2022 he received the Rudolf-Jaeckel-award of the German Vacuum Society to recognize outstanding achievements in vacuum-based sciences. In 2023 he was appointed as Honorary Doctor of the Faculty of Science and Technology, Uppsala University, Sweden.

Don Mattox Tutorial Keynote Presentation

1:20 PM to 2:00 AM (Monday, May 6, 2024); Continental B Ballroom

From Thin Films to Airplanes: Engineering Leadership in the Fulfillment of Serving as Many People as Possible

Marvi Matos Rodriguez

Boeing Corporation, Seattle, WA

Dr. Marvi Matos Rodriguez currently serves as the P-8 Air Vehicle IPT Director at Boeing, as a member of the National Science Board, as a member and secretary of the Great Minds in STEM Board of Directors and as a member of the Washington State Academy of Science. These roles and organizations are driven by different visions, missions and goals. However, they are also characterized by overarching themes: engineering leadership, engineering and scientific innovation and service. This talk explores the journey of an engineer and scientist turned into a leader and manager in aerospace, while focusing on values of servant leadership and engineering excellence. The keynote section will be designed as an interactive discussion with the audience to cover emergent trends in science and technology, the significance of public policy in the science and engineering enterprise and the pipeline of STEM professionals needed to drive the enterprise.



Dr. Marvi Matos Rodriguez works as Director of BDS Engineering, Mobility & Surveillance P-8 Air Vehicle IPT. Marvi has a BS in Chemical Engineering from the University of Puerto Rico, a PhD in Chemical Engineering and a MS in Colloids, Polymers and Surfaces from Carnegie Mellon University. In addition, Marvi has an executive MBA from the Massachusetts Institute of Technology. She worked as postdoc at the National Institute of Standards and Technology (NIST) under a fellowship from the National Research Council. She served as Lecturer in

Chemical Engineering and later as a Senior Research Scientist in Bioengineering at the University of Washington. She also worked as an independent consultant in the field of engineering innovations prior to joining aerospace. Marvi transitioned to Boeing as Scientist and Engineer. At Boeing she served as Thin Films research team lead, as Manufacturing Engineering manager, as Research and Technology manager and as director of Chemical Technologies, Metals and Ceramics.

Marvi worked at Blue Origin, where she served as director of Materials and Processes, as director of Crew Capsule team in the New Shepard Program and as the director for Mechanical Engineering leading structures, mechanical systems, fluids systems, technical design and materials and processes.

In her way back to Boeing, Marvi led the establishment of Design Practices as Director of Engineering, building a powerful Engineering knowledge system with an ecosystem of engineering functions, technical boards and councils, product family leaders and business unit leaders.

In her capacity as scientist and leader, Marvi has led the development of novel super alloys, thermal protection systems, and advanced manufacturing technologies and has supported rocket launches and rocket engine qualification work. Marvi is a servant leader, focused on Innovation and Outreach.

9:30 AM to 10:10 AM (Wednesday, May 8, 2024); Continental B Ballroom

Why Your AI Effort Failed... and How to Engineer Success

Dr. Sean McGregor

Underwriters Laboratories, Rancho Mission Viejo, CA

Adopting artificial intelligence systems capable of operating at fantastical speed and no marginal cost is a business imperative. However, every successful AI system is built on a mountain of failed attempts. Making a system safe for the complexities of the real world without first adding to the mountain of doomed projects requires learning from past successes and failures. This presentation details the elements of successful and failed machine learning programs as experienced by the startups and corporations producing them.



Dr. Sean McGregor is a machine learning research engineer who has worked with hundreds of organizations successfully (and unsuccessfully) shipping models all over the world. Most recently, Dr. McGregor Founded the Responsible AI Collaborative which is a leading index of AI incidents in the real world. He was also a lead consultant for the XPRIZE Foundation where he audited the safety, ethics, and impacts of 150+ teams competing for the \$5 million IBM Watson AI XPRIZE. Prior to founding the Responsible AI Collaborative, Dr. McGregor was a founding engineer with the neural accelerator startup Syntiant, a deep learning researcher at NASA Ames where he worked on an interdisciplinary team of heliophysicists and computer scientists to forecast solar flares, and founded the Privly Foundation where he designed and built a method for sharing content privately via third-party social media.

9:30 AM to 10:10 AM (Thursday, May 9, 2024); Continental B Ballroom

"New" Approaches to Controlling Composition and Crystallinity in Sputter-Deposited Thin Films

Suneel Kodambaka¹

Co-Authors: Koichi Tanaka², Aditya Deshpande², Pedro Arias², Angel Aleman², Hicham Zaid², Michael Liao², Cristian Ciobanu³, and Mark Goorsky²

¹Department of Materials Science and Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA

²Department of Materials Science and Engineering, University of California Los Angeles, Los Angeles, CA, USA

³Department of Mechanical Engineering and Materials Science Program, Colorado School of Mines, Golden, CO, USA

Composition and crystallinity are probably two of the most important material characteristics that dictate properties and life-time performance of materials. Compositional control in sputter-deposited thin films is typically achieved via changing the deposition parameters, such as partial pressure of the reactive gases, substrate temperature, deposition fluxes, and the target composition. Common approaches to improve crystallinity, to increase grain size and the grain orientation in thin solid films typically involve the use of single-crystalline substrates, high substrate temperatures combined with low deposition fluxes, and energetic ion beams.

In this talk, I will present approaches involving the use of ultra-low (e.g., 0.002%) partial pressures of the reactive gases and van der Waals (vdW) layers as buffer layers to grow thin films of desired composition and enhanced crystallinity. Using Ta-C and Mo-S as model materials systems, we demonstrate compositional tunability and improved crystallinity. We also shown that Ta₂C thin films grown on Ta₂C(0001) covered with hexagonal boron nitride (hBN), a vdW-bonded material, are more highly oriented than those films grown directly on bare Ta₂C(0001) under identical deposition conditions. That is, heteroepitaxial growth across a vdW layer seemingly yields better crystalline quality than homoepitaxy. We observe similar highly-oriented growth of face-centered cubic Pd, body centered cubic Mo, and hexagonal MoS₂ thin films on hBN-covered substrates. Our results provide new insights into the factors underlying the growth of highly-oriented thin films.



Suneel Kodambaka is the head of the department of materials science and engineering at Virginia Tech (VT). Prior to joining VT in 2022, Suneel was a professor in the department of materials science and engineering and the area director for structural materials for master of science in Engineering Online Program at the University of California Los Angeles (UCLA). Suneel graduated with a bachelor of technology degree (B.Tech.) from the Indian Institute of Technology, Madras, M.S., from Southern Illinois University at Carbondale (SIUC), and Ph.D. from the University of Illinois, Urbana-Champaign (UIUC). Suneel is a recipient of the 2010 Alumni Achievement award from the SIUC College of Engineering, 2009 AVS Thin Film Division's Paul Holloway Young Investigator Award, and 2008 Best Paper award from the IBM Materials Research Community. His research relies on in situ microscopy (SEM, TEM, LEEM, and STM) studies to develop fundamental understanding of the nucleation and growth kinetics and thermo-chemical and mechanical stabilities of crystalline solids. Suneel can be reached at kodambaka@vt.edu.



Atomic Layer Processing (ALP)



Atomic Layer Processing Approaches for Advanced Thin Film Heterojunctions

Virginia D. Wheeler, David R. Boris, Scott G. Walton, Marc Currie, Andrew C. Lang, Neeraj Nepal, Matt Hardy, Eric Jin, Steven P. Bennett, Brian P. Downey, David J. Meyer

U.S. Naval Research Laboratory, Washington D.C.

High-Powered Electron Beam Technology



EBPVD Thermal Barrier Coatings for the Aerospace Industry. Current Status, Challenges, and Future Outlook

Jason Van Sluytman

Honeywell R&D Coatings Division, Phoenix, AZ

Coatings and Processes for Biomedical Applications



A Hitchhiker's Guide to Antimicrobial Thin Film Coatings

Gregory Caputo

Professor in the Department of Chemistry & Biochemistry at Rowan University, Glassboro, NJ

High Power Impulse Magnetron Sputtering – HIPIMS



The Use of HiPIMS in an Industrial Setting

Jon W. Paggett

Kyocera Hardcoating Technologies, Cuyahoga Falls, OH

Coatings for Energy Conversion and Related Processes



Vertically Aligned Carbon Nanotube Coatings for Dendrite-Free and Stable Lithium-Metal Battery Anodes

Abdul-Rahman O. Raji, Tuqeer Nasir, Tuo Wang, Li He, William Ceren, Mina Moradnia, Sarathy Gopalakrishnan

Zeta Energy Corp., Houston, TX

Large Area Coatings



The Progress in Achieving Large Area RF Sputtering with Rotatable Magnetrons

Jesus Garcia

Advanced Energy Industries, Inc., Fort Collins, CO

Digital Transformation of Industrial Deposition Processes



How Will Our Vacuum Coater and Deposition Processes Look Like Tomorrow?

Wilmert De Bosscher

Soleras Advanced Coatings, Deinze, Belgium

Optical Coatings



MOCVD Technology for 2D-TMDC: Equipment, Processes, Material Properties and Future Applications

Michael Heuken

AIXTRON SE, Herzogenrath, Germany

Emerging and Translational Technologies and Applications



FlexGlass Pilotlab – An Innovative Platform for Emerging Use Cases

Jörg Neidhardt¹, Matthias Fahland, Wiebke Langgemach, Manuela Junghänel²

¹ Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technologies, Dresden, Germany

² Fraunhofer Institute for Reliability and Microintegration IZM, All Silicon System Integration Center Dresden – ASSID, Moritzburg, Germany

Coatings for Laser Fusion Ignition and Beyond



Christopher J. Stolz

Lawrence Livermore National Laboratory, Livermore, CA

Plasma Processing & Diagnostics



Plasma-Enhanced Chemical Film Conversion

R. Mohan Sankaran

Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, IL

Process Monitoring, Control, and Automation



Equipment Control in 2024 – from Must Haves to Future Dreams

Frank Geissler

Director Sales, Kontron AIS, Dresden, Germany



30 Years of Industrial Vacuum Robots: Leveraging Statistical Process Control to Enhance Performance and Reliability

Yehoram Yosubash, Hsiao-Lung Chang, Louis Dagenais, Nate Spiker, Chris Aitken, Stu Beale

Brooks Automation, Chelmsford, MA



Protective, Tribological and Decorative Coatings



CVD Coatings for Cutting Tools: Evolution and Challenges

Dev Banerjee

Kennametal, Latrobe, PA



Application of Thermal Barrier Coatings on Hotter Parts of Aero-engines Using EB-PVD Technology

Ravisankar Naraparaju, Uwe Schulz

German Aerospace Center (DLR), Cologne, Germany



Application of Various Coatings on Aircraft Jet Engine Parts

Tsunao Tezuka

IHI Corporation, Akishima-shi, Tokyo, Japan

Thin Film Sensors



Complex Germanates Thin Film Growth by Sub-Oxide Source Molecular-beam Epitaxy

Hanjong Paik

School of Electrical and Computer Engineering and Center for Quantum Research and Technology, University of Oklahoma, Norman, OK

Thin Film Contributions for the Hydrogen Economy



Thin Film Considerations for the Hydrogen Economy

Ralf Bendorf, Kai Ortner, Stefan Körner, Stephan Ulrich, Philipp Reinders, Rowena Duckstein, Guido Hora, Michael Vergöhl, Sabrina Zellmer, Christoph Herrmann

WebTech Roll-to-Roll Coatings for High-End Applications



Monitoring of Conductive Thin Films in Challenging Vacuum Environments by Eddy Current Sensors

Marcus Klein, Senthil Vinodh

SURAGUS GmbH, Dresden, Germany



TELEMARK



Quartz Crystal Deposition Controllers/Monitors/Crystals

Real-time thin film thickness and deposition rate monitoring and control. Reliable and economical instrumentation, sensors, and quartz crystals

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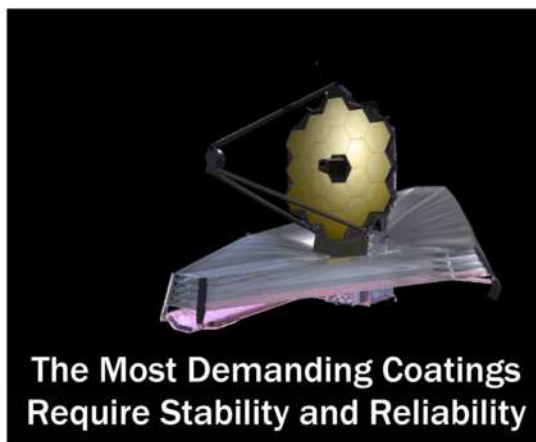
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The Most Demanding Coatings Require Stability and Reliability



UHV E-Beam Sources

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- Base pressure to 10^{-11} torr
- Capacity to 4x 40cc or 9x 4cc



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The modern SVC era has been the most intense period of innovation, member engagement, event management, and technology focus in the SVC's sixty-five year history. The SVC is completely focused on our stakeholders, developing an inclusive culture of listening, adopting, refining, and improving approaches that enhance the unique networking and problem solving culture that sets the SVC apart from all other professional organizations. In the spirit of this culture, we are proud to announce, "Colloquium at the TechCon"; a series of focused, technical conversations that address critical industrial needs. This meeting format was first introduced at the 2022 TechCon in Long Beach and based on the extremely positive feedback, we are bringing it back yet again in 2024!

Each topical workshop will be anchored by a technical presentation or series of presentations that will frame a follow-on roundtable discussion. Subject matter experts will be acting as moderators to facilitate discussions and promote interaction and networking between the attendees. As part tutorial, part problem solving, and part networking, the "Colloquium at the TechCon" represents the vanguard of the SVC's efforts to enhance and redefine the technical conference experience. These workshops will be open to all of our conference attendees and exhibitors.



Monday, May 6, 2024

10:30 AM • Continental A Ballroom

Sponsored by the SVC's HIPIMS Technical Advisory Committee

HIPIMS Success Stories

Moderator: Ton Hurkmans (IHI Ionbond Group, NL)

Event Description: High Power Impulse Magnetron Sputtering on industrial scale can look back at two decades of history. Many businesses have implemented HIPIMS commercially, and a growing list of innovators is weighing the pros and cons of this technology.

We have convened a panel of experts to share their success stories on implementing and using HIPIMS Technology in a broad range of applications:

- Herbert Gabriel (PVT Plasma und Vakuum Technik GmbH)
- Ju-Liang He (Feng Chia University)
- Christoph Schiffers (CemeCon AG)
- Thomas Schütte (PLASUS GmbH)
- Chinmay Trivedi (IHI Hauzer Techno Coating B.V.)

The HIPIMS Success Stories Colloquia will start off with a special "joint invited" presentation given by Dr. Ralf Bendorf of Fraunhofer IST and Dr. Arutun (Harry) Eghisarian of Sheffield Hallam University. Ralf and Harry are two pioneers in the development and implementation of HIPIMS and this lecture on the history of the technology will set the table for a vigorous panelist discussion to follow. The panelists will give a brief highlight on their individual HIPIMS success story, which will be opened to questions from the audience. Following the great interest in 2023 we have reserved 1.5 hours for your individual questions.

The colloquium provides a unique forum to meet with peers who have successfully implemented HIPIMS in their business, and gain deeper insights into the industrial challenges they faced and solutions HIPIMS can provide. You can address questions and voice issues and use the opportunity to connect with leading experts in industrial HIPIMS and all fellow colleagues.

Panelists:



Thomas Schütte, CEO, PLASUS GmbH

As a long-standing manufacturer of plasma monitor and process control systems, PLASUS GmbH also began working with HIPIMS processes around 10 years ago. Our HIPIMS success story has resulted in two unique EMICON control systems for industrial HIPIMS applications: a combined spectroscopic and electrical pulse curve measurement and a spectroscopic measurement system with unprecedented time resolution for pulse-resolved particle density monitoring and control.



Ton Hurkmans
IHI Ionbond Group, NL

HIPIMS Success Stories *continued*

Panelists:



Herbert Gabriele, General Manager, PVT Plasma und Vakuum Technik GmbH

Herbert used to work for decades with the arc evaporation process, however, started to look into HIPIMS 20 years ago, when sputtering overcame the lack of ionization. Through the liaison with Nano4Energy's Dr. Ivan Fernandez from Spain Herbert became a believer in HIPIMS. The latest developments are using this technology in highly productive in-Line coating systems for the deposition of anti-corrosion, highly conductive films on bipolar plates for fuel cells and electrolyzers.



Ju-Liang He, Professor, Feng Chia University

John has led Plasma Engineering Lab at Feng Chia University (FCU) for 30 years. Since 2018, he funded the Institute of Plasma (IoP, FCU) to conduct applied research and development for industry. Especially highly ionized plasma processes are the core technology. Having strong bonding with industries, successful HIPIMS deposition for different functional coatings are facilitated in many fields, which involved functional textile, wearable electronics, EMS coatings, medical devices, protective coatings. IoP also helps to develop industrial-scale intelligent coating machine based on an international collaboration.



Christoph Schifferse, CemeCon AG

Christoph is with CemeCon, the pioneer of HIPIMS coatings for cutting tools, for more than 15 years. HIPIMS has become the new standard in the cutting tool world because of the dense coating structure, the super smooth surface, and the enormous flexibility. The tremendous HIPIMS success story in the cutting tools industry suggests that HIPIMS will replace traditional techniques for high value products within a few years.



Colloquium 2.2

www.svc.org

The Challenge of Managing Defects in Production Optical Coating Processes

Event Description: Surface defects are an unpleasant reality for optical coating producers. They can occur unexpectedly and ruin batches of critical product, often for reasons that are difficult to detect. They may cause customer returns and even result in a loss of business. They will certainly cause you distress!

How can this be avoided? What are the best ways to detect them early in the process? How can you analyze them to find a clear root cause? What are some best practice methods to minimize defects, whether they occur in handling, loading, or deposition?

Let's discuss your problems in detail with the help of a diverse group of panelists representing defect metrology, coating system manufacturers, and coating producers themselves. In this interactive, collaborative session our panelists will present unique perspectives based on their experience, then hand the conversation to the audience to so that your specific problems can be discussed and hopefully solved!

Panelists:



Binyamin Rubin

Binyamin devoted ten years to developing ion thrusters for space propulsion before joining Veeco. Initially focusing on developing ion beam deposition equipment for optical coatings he progressed to become a technology manager. In this role he is responsible for plasma based thin film deposition and etch products with applications in semiconductors, optics, and data storage. Binyamin holds a BS and MS in Aerospace Engineering from the Moscow Institute of Physics and Technology and a PhD in Aerospace Engineering from Technion –the Israel Institute of Technology



Timothy Potts

BS, Engineering: Northeastern University; MS, Engineering: Northeastern University; MBA: University of Connecticut

Over forty years experience in all phases of the capital equipment business; development, engineering, marketing, sales and international operations. Last thirty years have been dedicated to laser and camera inspection businesses.

President of Dark Field Technologies, a high-resolution laser and camera inspection systems company, since 1997. Prior to Dark Field, President and CEO of Sira and Image Automation.



Thomas Gischkat

Thomas worked as coating engineer at Materion Balzers Optics in Liechtenstein for six years and as scientist for low loss optical coatings at RhySearch Institute in Switzerland and has deep knowledge in defects in thin films. Since 2022 he works as scientist at the Fraunhofer Institute for Applied Optics and Precision Engineering

IOF on low loss optical coatings for high power laser applications.

Thomas studied physics at Friedrich-Schiller-University in Jena, Germany and holds a PhD in Science. His doctoral thesis was about ion beam irradiation induced defects in LiNbO₃ for ion beam enhanced etching within the Ion Beam Physics group (Institute of Solid State Physics) at FSU Jena.

Colloquium 2.2

www.svc.org

Coating Thousands of Meters of Flexible Substrate in a Vacuum Coater – What Could Possibly Go Wrong?

Moderator: Liz Josephson (Intellivation)

Event Description: Roll-to-roll coating is a well-established high-productivity manufacturing method for functional films. However, quality and productivity are easily compromised by a myriad of environmental, handling, materials, hardware and maintenance issues. This event is aimed at both newcomers to roll-to-roll coating as well as process veterans, with the goal of discussing common questions and challenges in this important vacuum coating field. While the primary focus is on vacuum roll-to-roll coating, there are important pre- and post-processing techniques provided at ambient pressures that are also in-scope for this event.



Liz Josephson

The panel will open with a commemoration by **Andy Jack** (Emerson & Renwick) of the invaluable contributions that Dr. Charles Bishop has made to the Roll-to-Roll coating community.



Andy Jack

A panel of seasoned industry experts will highlight “best practices” and address common issues under the following topic areas:

- Deposition processes, cross-talk, gas- and vacuum system
– **Mike Simmons**, *Intellivation*
- Pre-, in- and post-processing of roll-to-roll substrates (in-/ex-situ, in vacuum or at ambient atmospheres)
– **Chris Stoessel**, *Stoessel Consulting*
- In-vacuum patterning and other specialty operations
– **Wolfgang Decker**, *K.J. Lesker Company*
- Process monitoring and in-situ metrology
– **Marcus Klein**, *Suragus*



Mike Simmons



Chris Stoessel



Wolfgang Decker



Marcus Klein

After brief introductions of the panelists, this highly interactive panel discussion welcomes questions and sharing of experiences from practitioners in the audience, and provides a unique opportunity to connect with topic matter experts and peers in the interest of improving industrial practice in vacuum roll-to-roll coating technology.”

Colloquium 2.2

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CVD Today and Going Forward

Moderator: Kalpak Shaha (IHI Ionbond Group)

Event Description: The requirements of Chemically Vapor Deposited (CVD) coatings for protective application has increased enormously over the past 50 years. The progress from simple monolayer coatings of the 1960s to the complex coating systems of today were made possible through increased development work, tailored to different applications needs. CVD technology has maintained an outstanding position for decades in the field of many applications. This success can be explained by the excellent mechanical properties and the thermochemical stability of the coatings. CVD is now a well-known technology in several industrial areas, like semiconductors, machining tools, components, coatings on fibre filaments, and powders.

Today's development trends are towards the capability of coating complex geometries, hard and wear resistant coatings at high temperatures and also deposition of very dense coatings that provide diffusion protection barriers at harsh conditions (corrosive atmosphere, high temperature, ...). Other developments are in several niche markets which ask for specifically designed coating material systems. In dedicated niche markets, CVD has the potential to fulfil very specific requirements as the coatings can be modified by either defined micro-structures, controlling the interface to different substrate materials and tailoring specific coating properties (for example electrical resistivity) by addition of doping elements. A good example is applying CVD technology in the optic and photovoltaic industries, where the coating properties are controlled to the required transparency or optical properties. It is applied on surfaces of multiple m², including continued motion methods.

The coating processes are based on the chemical reactions on hot surfaces between reactant gases, which directly yield the solid coating materials. Besides rather simple shaped parts, it can be applied on complex shaped catalyst carriers, single fibres or powders (up to some µm and even nm). The performance of CVD coatings is strongly dependent on the match with the base materials of the to be coated products (diffusion phenomena, phase changes, residual stresses, etc.) A successful application of a CVD coating includes dedicated pre- and post-treatment concepts, modern etching, surface texturing methods, and in some cases special annealing steps.

During the colloquium, we will discuss how the CVD technology can address current market needs, present different concepts on how new developed solutions can be applied in industries with high capacity and quality requirements (multiple tools to be coated versus single semiconductor part or multiple kilometres of fibre filaments). Further topics are the impact of environmental regulations and new concepts of dealing with sensitive chemicals (the precursors).

The expert panel represents academia, end users and equipment OEM's. In that way, a broad overview of future CVD technology trends and solutions will be discussed, that will enable you to understand deeper your current processes or to find coating solutions that you may be looking for.



Dr. Kalpak Shaha
IHI Ionbond



Prof. Dr. Urban Forsberg
Linköping University



Dr. Dev Banerjee
Kennametal



Dipl.-Ing. Frank Mumme
Gemeinnützige KIMW
Forschungs- GmbH



Dr. Christoph Czetti
Ceratizit



Dr. Hristo Strakov
Bernex

Colloquium 2.2

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Technical Program

DAYS AT A GLANCE

SATURDAY • MAY 4 | SUNDAY • MAY 5 | MONDAY • MAY 6

Saturday At A Glance

Education Program

Half Day Tutorials 9:30 AM – 1:00 PM

- C-230 Processing of Plastics for Better Protection, Reflection, and Decoration (Vergason) **PDR #2**

Full Day Tutorials 9:30 AM – 5:30 PM

- C-103 An Introduction to Physical Vapor Deposition Processes (Shah) **Williford B**
- C-205 Introduction to Optical Coating Design (Sargent) **PDR #1**
- C-208 Sputter Deposition for Industrial Applications – Session I (Glocker) **Marquette**
- C-333 Practice and Application of High Power Impulse Magnetron Sputtering (Bandorf/Ehiasarian) **Williford A**
- VT-201 High Vacuum Systems and Operation (O'Hanlon) **Williford C**

Sunday At A Glance

Education Program

Full Day Tutorials 9:30 AM – 5:30 PM

- C-212 Troubleshooting for Thin Film Deposition Processes (Miller) **Marquette**
- C-218 Advanced Design of Optical Thin Films (Willey) **Joliet**
- C-316 Introduction to Atomic Layer Deposition (ALD) Processes, Chemistries, and Applications (Biyikli) **Williford B**
- C-323 Fundamentals of High-Power Impulse Magnetron Sputtering - HIPIMS (Ehiasarian) **Williford A**
- VT-203 Residual Gas Analyzers and Analysis (O'Hanlon) **Williford C**

Special Events

- **SVC Board of Directors/Committee Chairs Meeting** 10:30 AM – 12:00 PM **Lake Huron**
- **SVC Board of Directors/Committee Chairs/TAC Chairs Best Practices Meeting** 1:00 PM – 3:00 PM **Buckingham Room**
- **Moderators Training Session** 3:30 PM – 4:00 PM **Continental B Ballroom**
- **Women in the SVC Meeting** 5:30 PM – 6:30 PM **Continental B Ballroom**
- **SVC Board of Directors Meet and Greet** 6:30 PM – 7:30 PM **Continental Ballroom Foyer**
- **Young Members Meeting** 7:30 PM – 8:30 PM **Continental B Ballroom**

Monday At A Glance

Education Program

Full Day Tutorials 9:30 AM – 5:30 PM

- C-217 Practical Production of Optical Thin Films (Willey) **4C**
- C-322 Characterization of Thick Films, Thin Films and Surfaces (Christensen) **4A**
- C-334 Manufacture of Precision Evaporative Coatings (Oliver) **4B**

Special Events

- **Technology Forum Breakfasts** 7:00 AM – 8:30 AM **International Ballroom North**
 - Digitalization in the Coating Industry – Does It (Already) Improve Production and Products?!
 - Optical Coating Design
 - Aligning Deposition Process Requirements with Vacuum System Layout and Design
 - Advanced Deposition Coating Hardware
 - Coatings for Thin Film Photovoltaics
 - CVD and ALD Processing
 - Thin Film Sensors
 - Ultra-Thin Flexible Glass - The Next Big Thing?
 - Supply Chains, Manufacturing Processes, and Sustainability for Materials Enabling PVD Processes
- **SVC Business Meeting** 8:40 AM – 9:10 AM **Continental B Ballroom**
- **Conference Introduction** 9:20 AM – 9:30 AM **Continental B Ballroom**
- **Colloquium: HIPIMS Success Stories** 10:30 AM – 12:30 PM **Continental A Ballroom**
- **SVC Foundation Casino Night** 8:00 PM – 10:00 PM **International Ballroom South**

Technical Sessions

- **Keynote Speaker Jochen Schneider** Sustainability Inspired Design of HIPIMS Deposited Coating Materials 9:30 AM – 10:10 AM **Continental B Ballroom**
- **High Power Impulse Magnetron Sputtering (HIPIMS)** AM/PM **Continental A Ballroom**
- **Plasma Processing and Diagnostics** AM **Continental B Ballroom**
- **Process Monitoring, Control, and Automation** AM **Continental C Ballroom**
- **Large Area Coatings** AM/PM **Buckingham Room**
- **Don Mattox Tutorial Speaker Marvi Matos Rodriguez** From Thin Films to Airplanes: Engineering Leadership in the Fulfilment of Serving as Many People as Possible 1:20 PM – 2:00 PM **Continental B Ballroom**
- **Atomic Layer Processing** PM **Continental B Ballroom**
- **Coatings and Processes for Biomedical Applications** PM **Continental C Ballroom**

Technical Program

DAYS AT A GLANCE

TUESDAY • MAY 7 | WEDNESDAY • MAY 8

Tuesday At A Glance

Education Program

Half Day Tutorials 9:30 AM – 1:00 PM

- C-214 Thin Film Deposition Optimization (Willey) **4D**
- C-220 Introduction to Two-Dimensional Materials (Muratore) **4C**
- C-320 Diamond-Like Carbon Coatings-from Basics to Industrial Realization (Keunecke/Savva/Haubold/Stein/Petzold) **4A**
- M-102 Introduction to Ellipsometry (Hilfiker) **4B**

Full Day Tutorials 9:30 AM – 5:30 PM

- C-337 ITO and Alternative TCO: From Fundamentals to Controlling Properties (Bright) **4K**
- VT-230 Design and Specification of Vacuum Deposition Systems (Belan) **4M**

Half Day Tutorial 2:00 PM – 5:30 PM

- M-201 Flexible Electronics (Muratore) **4C**

Special Events

- **Technology Forum Breakfasts** 7:00 AM – 8:30 AM
International Ballroom North
 - Industrial Challenges: Uptime, Yield, and Consistency
 - Energy Conversion and Storage
 - High-Powered Electron Beam Technology
 - High Power Impulse Magnetron Sputtering (HIPIMS)
 - Process Monitoring and Control
 - Magnetron Sputtering
 - Tribological and Diamond-Like Coatings
 - Coatings and Surface Engineering for Medical Applications
 - Leak Detection – Issues and Practices
- **Awards Ceremony** 8:40 AM – 9:20 AM **Continental B Ballroom**
- **B2B Exhibitor Coffee Hour** (closed event) 12:00 PM – 1:00 PM
Exhibit Hall Salon C/D
- **Exhibit Hall Open** 1:00 PM – 6:00 PM **Exhibit Hall Salon C/D**
- **Welcome Reception** 5:00 PM – 6:00 PM **Exhibit Hall Salon C/D**

Technical Sessions

- **High Power Impulse Magnetron Sputtering (HIPIMS)** – AM
Continental A Ballroom
- **Plasma Processing and Diagnostics** AM
Continental B Ballroom
- **Process Monitoring, Control, and Automation** AM
Continental C Ballroom
- **Thin Film Contributions to the Hydrogen Economy** AM
Continental B Ballroom
- **Exhibitor Innovator Showcase** AM **Buckingham Room**
- **Poster Session** 2:30 PM – 4:30 PM **Exhibit Hall Salon C**

Wednesday At A Glance

Education Program

Half Day Tutorials 9:30 AM – 1:00 PM

- C-204 Basics of Vacuum Web Coating (Simmons) **4D**
- C-210 Introduction to Plasma Processing (Baránková/Bardos) **4B**
- C-272 Biomedical Coatings for Antimicrobial Applications (Hettinger/Caputo) **4K**
- M-240 Basics and Applications of Electron Beam Technology for Manufacturing Processes (Saager) **4A**

Full Day Tutorials 9:30 AM – 5:30 PM

- C-338 Application of Reactive Sputtering (Bandorf/Gerdes) **4M**
- VT-240 Practical Elements of Leak Detection (Deluca) **4C**

Half Day Tutorial 2:00 PM – 5:30 PM

- C-306 Non-Conventional Plasma Sources and Methods in Processing Technology (Baránková/Bardos) **4B**
- M-210 Introduction to Solid-State Thin Film Batteries (Gaines) **4D**

Special Events

- **SVC Foundation Annual 5K Fun Run and Walk** 6:00 AM (bib pick up at 5:30 AM **Hilton Lobby**)
- **Technical Advisory Committee Breakfast Meetings** 7:00 AM – 8:30 AM **International Ballroom North**
- **Exhibitor Meeting** (closed event) 9:00 AM – 10:00 AM
Exhibit Hall Salon C/D
- **Exhibit Hall Open** 10:00 AM – 4:00 PM **Exhibit Hall Salon C/D**
- **Beer Blast** 2:00 PM – 4:00 PM **Exhibit Hall Salon C/D**
- **Announcement of 5K Run and Best Poster Winners** 3:00 PM
Exhibit Hall Salon C/D
- **Program Committee Meeting** 5:30 PM – 7:30 PM
Lake Huron Room

Technical Sessions

- **Keynote Speaker Sean McGregor** Why Your AI Effort Failed... and How to Engineer Success 8:40 AM – 9:20 AM
Continental B Ballroom
- **Optical Coatings** AM **Continental A Ballroom**
- **Protective, Tribological, and Decorative Coatings** AM
Continental B Ballroom
- **Emerging and Translational Technologies and Applications** PM **Continental C Ballroom**
- **Exhibitor Innovator Showcase** AM **Buckingham Room**

THURSDAY • MAY 9

Thursday At A Glance Education Program

Half Day Tutorials 9:30 AM – 1:00 PM

- M-140 Mass Flow Controllers: Fundamentals, Troubleshooting, and Calibration (Baker) **4K**
- M-250 Deposition Process Simulation (Barton) **4D**

Full Day Tutorials 9:30 AM – 5:30 PM

- C-212 Troubleshooting for Thin Film Deposition Processes – Session 2 (Miller) **4M**
- M-120 Design of Experiments for R&D (Grace) **4A**

Special Events

- **Technology Forum Breakfasts** 7:00 AM – 8:30 AM
International Ballroom North
 - Fabrication and Performance of Optical Coatings
 - Transparent Conductive Materials (TCM)
 - Protective, Reflective, and Decorative Coatings
 - Manufacturing in Space
 - Atmospheric Plasma Technology
 - Post-Processing of Vacuum-Coated Roll-to-Roll Products
 - Surface Engineering for the Hydrogen Economy
- **Colloquium: The Challenges of Managing Defects in Production Optical Coating Processes** 9:30 AM – 11:10 AM
Continental A Ballroom
- **Colloquium: Coating Thousands of Meters of Flexible Substrate in a Vacuum Coater – What Could Possibly Go Wrong?** 1:20 PM – 2:40 PM *Continental C Ballroom*
- **Young Members Group/Farewell Social** 6:00 PM – 7:30 PM
International Ballroom South

Technical Sessions

- **Keynote Speaker Suneel Kodaambaka** “New” Approaches to Controlling Composition and Crystallinity in Sputter-Deposited Thin Films 8:40 AM – 9:20 AM *Continental B Ballroom*
- **Optical Coatings** AM/PM *Continental A Ballroom*
- **Protective, Tribological, and Decorative Coatings** AM/PM
Continental B Ballroom
- **Digital Transformation of Industrial Deposition Processes** AM
Continental C Ballroom
- **High-Powered Electron Beam Technology** AM
Buckingham Room
- **WebTech Roll-to-Roll Coatings for High-End Applications** PM
Continental C Ballroom
- **Thin Film Sensors** PM *Buckingham Room*
- **Coatings for Energy Conversion and Related Processes** PM
Continental A Ballroom

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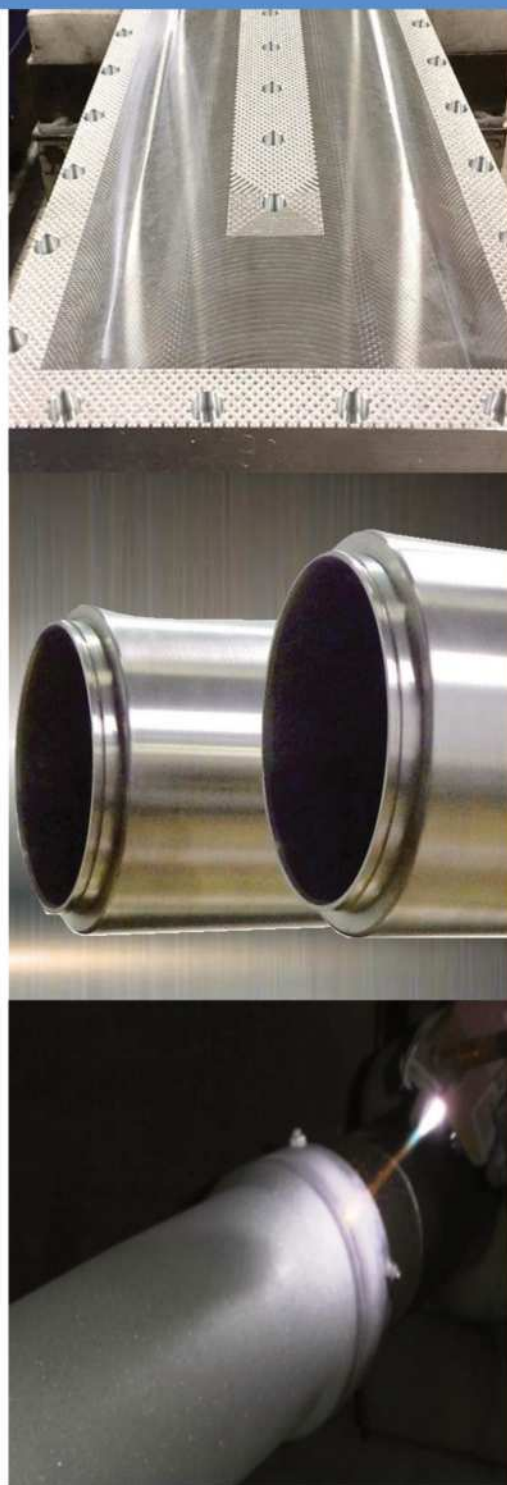
Planar Targets are designed and manufactured to carefully avoid the introduction of raw material surface contaminants to the thin film coating process. Our target products are available in segmented planar and/or monolithic planar styles. We achieve the superior material utilization and lot to lot stability. Our state-of-the-art internal process controls ensure the proper grain size with minimal alloy gradient, regardless of size. Machined to meet the customer's specifications, each target is thoroughly inspected and individually packaged to customer's specification.

Rotatable Targets

MSI has the machining capabilities to manufacture any end seal configuration with minimum lead times. Our custom casting thickness is available up to 16mm.

Thermal Spray

MSI produces Ceramic and Metal Sputtering Targets up to 4 meters in length using our Thermal Spray processes. With Thermal Spray both metals and oxides, high temperature melting metals and alloys can be sprayed to produce sputtering targets that could not be economically produced with other fabrication methods.



MSI is very committed in providing the best quality sputtering target for your coating needs.

Please contact MSI for your Sputtering Targets.

Contact us for more details!

sales@msitarget.com or 614-870-0400

Exhibiting Companies

and etch technologies, we provide production proven systems in diverse applications including laser and IR detectors, AR/VR and flexible display, delayering, precision optics, and superconductors to match customer needs.

DHF Technical Products

1109

<https://www.dhftargets.com>

Presenting DHF Tech Products, the gold, silver, platinum and palladium standard of sputtering targets. DHF Technical Products helps make the most of your precious metal investment with innovative sputter target designs, manufacturing and financing that keeps more of your working capital working for you. This includes a target recycling program that turns your spent targets into cash or immediate credit toward a new target. Coupled with world class customer service DHF is the leader in PM targets

Dynavac

810

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<https://dynavac.com/solutions/thin-film-deposition-systems/>

Dynavac designs and manufactures world-class thin film deposition systems that utilize evaporation, sputtering, and plasma technologies. We build both batch and inline coating systems of all sizes. From precision optical and decorative coatings to high-reflective films for astronomical mirrors, our physical vapor deposition (PVD) and plasma-enhanced chemical vapor

deposition (PE-CVD) solutions optimize the quality and performance of your end product while helping you reduce costs.

E+R Group

416

<https://www.eandr.com>

Combining our engineering knowledge from machinery build and substrate handling, we offer vacuum machinery coating platforms expertly designed to the application – meeting and surpassing our customers' needs.

These platforms include pilot scale vacuum coaters for R&D purposes or small-scale production, through to matched production machinery for customers looking to expand the width and productivity of an application with market potential.

This equipment offers higher productivity rates, lower costs, plus differentiating specifications and apps

EBARA Technologies Inc.

120

<https://www.ebaratech.com>

EBARA Technologies Incorporated operates two divisions (Components Division / Semiconductor Equipment Division) and is the North American subsidiary of EBARA CORPORATION, Precision Machinery Company, a global, world-leading manufacturer of vacuum pumps and advanced technology products front-end and back-end manufacturing.

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ECS - The Electrochemical Society**415**<https://www.electrochem.org/>

ECS-The Electrochemical Society, a nonprofit professional society established in 1902, advances theory and practice at the forefront of electrochemistry and solid state science and technology, and allied subjects. Our robust global membership researches innovative solutions to major challenges. ECS hosts prestigious meetings, publishes research, fosters education, and collaborates with other organizations.

Upcoming Meetings - Join us!

245th ECS Meeting, May 26-30, 2024 – San Francisco, CA
PRiME 2024, October 6-11, 2024 – Honolulu, HI

Ferrotec**412**<https://www.ferrotec.com>

Ferrotec is a world leader in advanced material, component, and system solutions. Ferrotec manufactures precision electron

beam evaporation, sputtering and thin film coating solutions including complete systems, integrated component packages for system builders, or components and accessories for system users who need replacements or upgrades. Our booth features our Temescal e-beam products, MeiVac components, and our Vacuum Feedthrough products. For more information, visit www.ferrotec.com.

FHR Anlagenbau GmbH**513****TECHCON SPONSOR**<https://www.fhr.biz/en/>

FHR Anlagenbau GmbH: The Thin Film Company

We are a part of the Vital Materials Co., Limited and a leading provider of vacuum coating systems. Industries such as electronics, MEMS and sensor technology, precision optics and display, solar thermal and photovoltaics rely on our cutting-edge thin film solutions. Tailor your application with our versatile product series: highly flexible FHR.Star-Series for wafer-based substrates, FHR.Line-Series with optimized throughput and lifetime for large areas, and FHR.Roll-Series for flexible substrates.

Fil-Tech, Inc.**1008****TECHCON SPONSOR**<https://www.filtech.com>

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Film Sense**805**<https://film-sense.com/>

Film Sense Multi-Wavelength Ellipsometers are well suited for ex situ, in situ, and automated mapping measurements of thin films. Film Sense ellipsometers are an affordable, easy to use, non-destructible solution that can measure the thickness and index of refraction of most ideal transparent films in the 0 - 5000 nm thickness range, and many absorbing thin films in the 0 - 200 nm (depending on the material).

Forge Nano, Inc.**217**<https://www.forgenano.com>

Forge Nano's Atomic Layer Deposition (ALD) technology lets you design products from the atoms up, improving performance with precision unlike anything else. By manufacturing with atoms, we can unlock your products' potential, allowing you to manipulate matter in its most fundamental form.

Forge Nano has proven that Atomic Layer Deposition (ALD) improves performance of a vast range of metrics for powders, wafers, & objects with applications in batteries, compound semiconductors, LEDs, and others

Fraunhofer FEP**514**<https://www.fep.fraunhofer.de>

Fraunhofer FEP works on innovative solutions in the fields of vacuum coating, surface treatment and organic semiconduc-

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Exhibiting Companies

tors. The core competences electron beam technology, plasma-assisted large-area and precision coating, roll-to-roll technologies, development of technological key components as well as technologies for the organic electronics and IC/system design provide a basis for these activities.

Genco Ltd

213

<https://www.genco.com>

Genco provide highly advanced deposition instruments and process support for PVD and PECVD processes. Visit our booth to see our newest products: Optix wide range process gas monitor, GRS series of rotatable magnetrons for laboratory to industrial scale, plasma sources for surface functionalization and deposition and Speedflo for control of reactive processes. Our skilled team can provide advice on optimizing your process to achieve the best possible performance.

GNB King Lai Group

1110

<https://www.gnbvac.com>

GNB is a world-class vacuum hardware manufacturing organization and a market leader for large-sized, high-temperature gate valves, valves for highly contaminated environments, valves integrated into systems, and valve customization. With ISO 9000 certification and ASME U-stamp certification, GNB specializes in vacuum valves, angle valves, ball valves, vacuum chambers, and vacuum hardware accessories, including: KF flanges, CF flanges, ISO Flanges and vacuum fittings.

GP Plasma LLC

205

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<https://gpplasma.com>

GP Plasma's holistic approach to problem solving takes the big picture view before focusing on what is right for you. Solving complex functional surface problems from design to manufacture, our expertise guides you through the pitfalls to arrive at the best solution for your manufacturing needs. Via our network of specialists, we offer a short path to new markets, PVD/PACVD design, selection, and manufacturing optimization. At the heart of innovation is collaboration and education, we'll work together with you to find a solid path to success.

HIGHVAC

1106

<https://www.highvacgroup.com>

With our extensive vacuum experience, personalized service, and innovative solutions, HIGHVAC is your best choice for vacuum pump needs. As a leading independent supplier of vacuum pumps and rebuilds in North America since 1993, we strive to find you the best product for your application. Our portfolio includes oil sealed rotary vane, dry screw, air cooled multi-stage roots, booster, and scroll pumps. We know vacuum.

Hine Automation

922

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At Hine Automation, we strive to provide the most cost-effective automation solutions while also delivering unparalleled customer service and support.

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of-the-art robotic components and automation systems in the semiconductor, solar, flat panel display, and related industries worldwide.

HORIBA

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https://www.horiba.com/en_en/

The HORIBA product line-up consists of Mass Flow Controllers and Mass Flow Meters including High Temperature Mass Flow and Liquid Mass Flow. Liquid Automatic Refill Systems, Liquid Vaporizers, Mixed Injection Systems and Gas Concentration Monitors. In all stages, from materials evaluation through to final inspection, HORIBA products maintain precision control in your process.

HVA, LLC

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<https://www.vacuumvalves.com>

Vacuum valve manufacturers located USA Reno, Nevada.

IHI Hauser Techno Coating BV

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Hauser Techno Coating is an expert in PVD coating technology in decorative, automotive and tool markets. Hauser Flexicoat® equipment offers the possibility to combine different technologies in one process; e.g. ARC, UBM, and HIPIMS. In their Competence Centre customers are served with coating development, process qualification and pilot production.

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<https://www.impedans.com/>

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INFICON

906

<https://www.inficon.com/>

INFICON offers vacuum measurement, components, gas analysis, measurement and advanced process control through residual gas analyzers (mass spectrometers), helium leak detectors, multi-gas leak detectors, thin film deposition controllers and monitors, RF sensors, sensor integration and analysis software.

InstruTech

1118

<https://www.instrutechinc.com>

InstruTech's product portfolio of vacuum gauges and vacuum measurement controllers includes convection enhanced pirani, hot cathode Bayard-Alpert ionization, cold cathode inverted magnetron, full range vacuum gauges, capacitance diaphragm gauges and vacuum switches. InstruTech vacuum gauges offer built-in or remote controllers and displays with pressure measurement capability from 2.00E-11 Torr to atmosphere.

Intellivation

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<https://www.intellivation.com/>

Intellivation is a leading manufacturer of vacuum web coating systems featuring innovative design and powerful automation. Our products serve high tech application areas including flexible electronics, thin film battery, ultracapacitors, superconductors, solar, optical coatings, medical devices, defense, and more. Our on-site application laboratory featuring the R2R500 roll-to-roll coater allows us to support customers with thin film coating development services on flexible substrates.

Intevac, Inc.

920

<https://www.intevac.com>

Intevac is a global industry leader in the design and manufacturing of thin film capital equipment. Through its expertise and innovation in the field of material science, process design and capital equipment manufacturing, for 30 years it has led the way in enabling world-leading thin film coatings. Intevac's 200 Lean® platform has led its field in HDD coating for more than 20 years already and our TRIO™ platform is rapidly disrupting what is possible in the coating of consumer devices.

Ionautics

913

<https://www.ionautics.com>

Ionautics is the leading provider of High-Power Impulse Magnetron Sputtering (HiPIMS) technology and process know-how. We offer high-performance HiPIMS power supplies, bias supplies, synchronization units, reactive process control system, etc., that will enable successful and user-friendly thin film

deposition processes. We always go the extra mile to provide not only an excellent product, but also the guidance on how to best use the HiPIMS technology.

Ionbond - IHI Group

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<https://www.ionbond.com>

Ionbond provides advanced coating solutions for applications in the aerospace, medical, food contact, automotive, decorative and tooling industries. We offer a broad range of hard, low-friction, wear-resistant coatings based on PVD, PACVD and CVD technologies.

With 35 job coating centers in 15 countries in Europe, North America and Asia, Ionbond has one of the largest coating networks in the world. Ionbond is part of renowned Japanese industrial consortium IHI Group.

iVAC Coating Technology

809

<https://www.ivac-coating.com>

iVAC Coating Technology is specialized in the coating equipment and core components based on plasma process nano-meter thin film manufacturing. Our main products include: Plasma power supply, Magnetron, Mass flow controller, Magnetic fluid seals, Sputtering target and Atomic layer deposition system. Our products are widely used in fields such as Semiconductor, Photovoltaic, Touch screen, Optical, Aerospace, Data storage, Automobile industry, Glass industry, Medical equipment, Hard coating, Biochemistry, Lithium battery industry and R&D, etc.


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A company is made or broken on its reputation. Which is why, at Sierra Applied Sciences, we've built our reputation on integrity. Rather than specsmanship, we deliver proof. When we make a promise, you get results. And when we say you can rely absolutely on our products and services, be assured that you'll get the most advanced high-performance planar magnetron cathodes for the thin-film industry. Period.

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<https://www.jawoollam.com>**200**

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Kaufman & Robinson, Inc.**118**<https://www.ionsources.com>

Kaufman & Robinson, Inc. engineers a wide range of ion & plasma sources, electron neutralizers, and power supplies. KRI's innovative vacuum-based process tools interact with materials on the atomic level. Their products and employees can assist with thin film depositions, etching processes, and material modifications.

With over 40 years of leadership, knowledge, and experience within the industry, KRI is the Ion Beam Authority that you can trust and depend on.

Kolzer

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We design and manufacture Vacuum Coating Machines in Milan since 1952 and currently we are recognized as a strong and consolidated leadership in the European and global market.

Many years of experience allow us to have a broad and complete view of surface treatments in different application fields. We strongly believe in the value of technology transfer, so we do not hesitate to share our know-how with our customers to support them in their choices.

Korvus Technology**820**<https://korvustech.com/>

Korvus Technology manufactures highly modular thin film deposition systems. The company's HEX platform offers an unmatched level of user control and customization, designed to incorporate the latest thin film technologies and performance into a bench top PVD system.

With over 20 years experiences and 100+ installations worldwide, HEX systems are utilized in academic and industry settings to advance research into novel thin film materials.

KSM Co., Ltd. | KSM Vacuum Products Inc. (KSM USA)<https://www.ksm.co.kr> or <https://www.ksmusa.com>

Global Leaders in the Custom Design & Manufacturer of Welded Metal Bellows, Heaters, SiC Fine Ceramics & More. For 40+ Years KSM has custom designed & manufactured Critical Vacuum-Seal & Heating Products for UHV / Semiconductor Equipment. Key strategic supplier to global leading SEMICONDUCTOR OEM's (WFE, Solar + Flat Panel Display Markets).

- Welded Metal Bellows
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MAGPULS GmbH 811

<https://www.magpuls.de>

MAGPULS company is a German company, located in Sinzheim in the vicinity of Baden Baden.

MAGPULS GmbH is specialized in developing and manufacturing of voltage pulsed power supplies within the product power range of 1kW DC and 35A peak current for small laboratory applications up to 600kW DC and 3000 A peak current for industrial applications.

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Materials Science International Inc. 407

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<https://msitarget.com/>

Materials Science International, Inc. (MSI) is a world class manufacturer of high-quality sputtering targets. MSI's growth in the industry is due to our commitment of providing customers with exceptional value and service. MSI was founded in 1981 and has maintained an ISO 9001:2015 Certification. MSI's mission is to become the leading manufacturer of quality sputtering targets worldwide.

MSI Services many industries:

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- Automotive
- Photo-voltaic
- Optical coatings
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Materion Corporation 212

<https://www.materion.com/advanced-materials>

Materion is your source for high-performance thin film deposition materials and sputtering targets. We are a global supplier of precious and non-precious materials for large area coatings, including rotary and planar sputtering targets, evaporation materials, and inorganic chemicals. We take pride in working with our customers to develop customized solutions for applications including architectural and automotive glass, wear and decorative coatings, solar coatings, web coatings, and display.

Megacold LLC 912

<https://www.megacold.uk.com/cryopumps>

We are the market leader for process cooling equipment in critical applications across the UK and America with service engineers strategically placed across the globe to perform cryopump installation the year round. Megacold are proud to have been expertly servicing and advising the cryogenic sector for 50 years and are trusted by OEM's operating with high precision vacuum systems. Our global servicing capabilities give us the competitive edge when reacting to customer faults.

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tantalum. MTS also supplies tungsten, molybdenum, and tantalum raw material and custom machines parts from these metals. MTS offers its own brand of silicone diffusion pump fluid and TIG welding electrodes. We carry an extensive inventory to assure prompt delivery.

MKS Instruments, Inc.

819

<https://www.mks.com>

MKS Instruments is a global provider of instruments, systems, subsystems and process control solutions that measure, monitor, deliver, analyze, power and control critical parameters of advanced manufacturing processes to improve process performance and productivity for our customers. Additional information can be found at www.mksinst.com.

MORETEC Group

1113

<http://www.moretec-inc.com/en/>

MORETEC is a company headquartered in Japan. We design and manufacture high quality, customizable ferrofluid feedthroughs for PVD/CVD systems at competitive price.

During the 25 years in the vacuum coater industry, we focused on feedthroughs and gained great experience. our product excels in stability, high precision, long service life and customization.

We believe that by using our product as vacuum rotary seals, you could improve your machines' quality to an even higher level!

Mullen Equipment Corporation

320

<https://www.mullenequipment.com>

Based in Troy, Michigan, Mullen Equipment has been a successful industrial equipment representative and chemical equipment distributor in the Midwest since 1950. Generating significant sales for our principals in the Chemical industry products sector, Pharmaceutical process solutions, Petrochemical industry, Industrial sector services, Municipal solutions, Food & Beverage, Paper & Pulp, and various other industries. Today, we continue to expand our reach and areas of expertise through excellent service to our customers and principals. Call or email us today to learn more. (248) 643-8120 Mulleneq@mullenequipment.com

Mustang Vacuum Systems, Inc.

314

<https://www.mustangvac.com>

Global leader in thin-film equipment design/manufacturing and process development.

Nano4Energy SL

205

<https://nano4energy.eu>

Nano4Energy provides state-of-art PVD coatings and HiPV® bipolar HiPIMS power supplies strongly focused on R&D and tailor-made solutions to attain optimum performance in our customers' products. Coatings for cutting tools, molds, dies, Hydrogen tech. & 3C products leverage our pioneering HiPIMS tech from 6-20kW. We have an applications lab, characterization equipment and deposition systems from lab to industrial scale in 4000sq.ft facilities in Madrid, Spain. We guide you from idea to design & implementation in full scale industrial systems.

NAVAC Inc.

708

<https://navacvacuum.com/>

NAVAC is the global leader in rotary vane vacuum pump manufacturing. With a legacy of over three decades at the forefront of technological advancements in vacuum pumps, NAVAC has consistently set the industry standard for innovation and quality. As the world's largest rotary vane pump manufacturer, we take pride in empowering our customers in perfecting their systems with cutting-edge vacuum technology.

Normandale Community College

1116

<https://www.normandale.edu>

Normandale Community College is a public community college in Bloomington, Minnesota. Normandale offers a 2-year A.A.S. degree as well as 2 certificate programs of study in Vacuum and Thin Film Technology. The curriculum is geared toward individuals who will pursue employment as maintenance or process technicians for organizations that utilize vacuum system-based processes. Normandale's Vacuum Technology classes are delivered in distance learning modalities including hands-on experiences using remotely accessible vacuum systems.

Nova Fabrica Ltd.

808

<https://www.novafabrica.biz>

Nova Fabrica provide solutions that enable production yield optimisation through advanced process characterisation, monitoring, control and automation.

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By maximizing target utilization, Sierra Applied Sciences's magnetron cathodes can help you dramatically improve the quality, performance and life of your products. Our difference is a patented magnet design that traps electrons in inner, center and outer erosion zones with magnetic field shapes carefully balanced for even erosion. And it's a difference you can see in superior performance, longer target life—and your products.

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 SIERRA APPLIED SCIENCES™

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Nova Fabrica products include plasma emission monitoring systems, reactive gas control systems, residual and process gas analysis systems, deposition rate measurement systems, optical and sheet resistance measurement systems, plant-wide supervisory process control system, optical monitoring assemblies, fibre-optic components.

Osaka Vacuum USA, Inc.

420

<https://www.osakavacuum.co.jp/en>

In business since 1950, Osaka Vacuum is a manufacturer of highly reliable vacuum systems, industrial vacuum pumps, and vacuum pumping systems. Products include dry vacuum pumps, roots vacuum pumps, turbo molecular pumps, rotary vane vacuum pumps, liquid-ring vacuum pumps, oil-sealed vacuum pumps and more. Our motto is reliable, long-lasting products that give you safety and satisfaction.

Pfeiffer Vacuum

803

<https://www.pfeiffer-vacuum.com/en/>

Pfeiffer Vacuum provides vacuum solutions from a single source. We supply a full range of hybrid and magnetically levitated turbo pumps, rotary vane, Roots and dry pumps, helium/hydrogen leak detectors, gas analyzers, mass spectrometers, vacuum gauges, chambers, valves and components.

Plansee USA LLC

806

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<https://www.plansee.com>

Strong metals for strong products. Plansee is an expert in components made from molybdenum, tungsten, tantalum, and niobium. Whether in electronics, coating technology, or high-temperature furnaces, where regular metals reach their limits, the refractory metals, alloys, and composite materials from Plansee come into play.

Plasma Process Group, Inc.

219

<https://www.plasmaprocessgroup.com>

Plasma Process Group provides high performance ion beam sources and components required for precision thin film deposition and etching applications. Our scientists are experts in ion optics, ion beam sources and associated RF and DC technologies. We complement our group with a complete service and support center, servicing a variety of ion beam equipment.

PlasmaSolve

815

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<https://plasmasolve.com>

PlasmaSolve specializes in developing cutting-edge digital twin solutions that cater to PVD and PECVD coating processes, as well as other plasma-powered technologies such as gas conversion, etching, and ion sources. We use machine learning, physics simulation, or a combination of both. Our experts specialize in plasma, plasma-material interactions, film growth mechanisms, crystallography, and thin film characterization. Our digital twins have been successful in R&D and mass-production settings.

PLASUS GmbH

911

<https://www.plasus.de>

PLASUS is a leading manufacturer of spectroscopic plasma monitor and process control systems for low-pressure as well as atmospheric pressure plasma applications in R&D as well as productions lines. Our turnkey EMICON systems are most suitable for plasma analysis, optimisation of plasma processes as well as active process, e.g. reactive sputtering, endpoint detection, quality control and fault detection. In addition to our main spectroscopic technology add-on modules for HIPIMS applications and simultaneous layer control are available.

Process Materials, Inc

1108

<https://www.processmaterials.com>

Process Materials is a leading supplier of consumable materials serving the thin film industry. Products include planar sputtering targets and cylindrical sputtering targets used in the production of flat panel displays, data storage devices, architectural glass, automotive glass, photovoltaic, optical media, decorative coating, AR, LCDs, hard coatings, etc. Target materials available include pure metals (including precious metals), alloys and compounds.

Protec Surface Technologies Srl

814

<https://www.protectim.com/en/>

Protec Surface Technologies is an Italian company, founded in 1996, that designs and manufactures PVD and PECVD coating systems and supply as well as turn-key solutions for thin film coatings in decorative, technical and tribological markets.

Thanks to its experience Protec Surface Technologies is organized to perform all activities connected with thin film coatings, including technical assistance, moreover is present in every continent and in each industry.

Protech Materials

414

<https://www.protechmaterials.com>

Welcome to Protech Materials, INC. We are a well-known High Quality Leading supplier of Vacuum coating materials and associated components and services in Hayward CA since 1997.

- Products include all pure elements, alloys, ceramics, and custom materials.

SERVICES include:

- Indium and Solder bonding
- any sized planar or rotary target.
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- Sprayed rotary targets
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PVT Plasma und Vakuum Technik

115

<https://www.pvtvacuum.de>

PVT is worldwide highly renown for its achievements in the field of ion- and plasma-assisted vacuum technologies. Our worldwide customer base is using our know-how for their thin film applications.

Exhibiting Companies

R. D. Mathis Company

1102

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<https://www.rdmathis.com>

Evaporation Sources and Materials. We offer the highest quality Evaporation Sources, E-Beam Liners and Evaporation Materials for the thin film coating industries. Our Catalog offers a comprehensive selection of Tungsten, Molybdenum and Tantalum sources as well as custom fabrication. We also offer a variety of E-Beam Liners and evaporation materials including Au, Ag, Ni, Al, etc. Our Low Voltage, High Current Power Supplies and our Inert Gas Purifiers are available to compliment your process.

Rocky Brook Associates, Inc

909

<https://www.rockybrookinc.com>

ATTENTION OEMs, TARGET MAKERS & RE-SELLERS Production facilities in Narragansett, RI include DYNAMIC WATER JET CUTTING, CNC VERTICAL MILLING, PLATE SAWING, CNC HORIZONTAL TURNING & PRODUCTION BANDSAW CUTTING. We produce, using either our material or yours: TARGETS & BACKING PLATES (direct or internally cooled & custom) in Cu, Ti, Cr, Mo, Al to 99.999% pure. We specialize in Copper - but work in many other materials. We ship Worldwide! TRY US - YOU'LL BE GLAD YOU DID!

RSC - Reliable Silver Corporation

215

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<https://www.reliablecorp.com>

RSC - Reliable Silver Corporation - precious metals for thin films RSC manufactures in the US and provides precious metal evaporation materials and sputtering targets for thin film deposition. RSC focuses on silver, gold, platinum, and palladium. Products serve a broad set of applications including large area coatings, semiconductor, electronics, medical product coatings, aerospace, LED, and wearable technology. RSC's reputation for performance, quality, price, delivery, and flexibility is unmatched by competitors in the industry.

RUBIG Industrial Furnaces

216

<https://www.rubig.com/en>

RUBIG Industrial Furnaces has been producing customized heat treatment plants since 1992. The know-how reflected in the construction of the furnaces has been gained in the in-house job shop. With the new brand generations MICROPULS® and GASCON, RUBIG has reached new heights in nitriding and coating. RUBIG is supplying big automotive companies, the aviation industry as well as small commercial job shops in more than 40 countries.

SCI Engineered Materials

818

<https://sciengineeredmaterials.com/>

SCI Engineered Materials is a global supplier and manufacturer of advanced materials for PVD Thin Film applications. Through partnerships with end users and OEM's, SCI develops innovative and customized solutions enabling commercial success.

Semicore Equipment, Inc.

1018

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<https://www.semicore.com>

Semicore Equipment, Inc., a Silicon Valley based manufacturer, supplies, services and supports Sputtering, Evaporation, Thin Film PVD systems for the electronics, optical, solar energy, medical, military, academic and related high technology industries worldwide. Semicore's products provide quality coatings on a variety of materials including plastic films, glass, ceramics, metals and hybrid substrates and range from R&D to high-performance production level systems at a competitive price.

Sierra Applied Sciences

1007

<https://www.sierraapplied.com>


Sierra Applied Sciences, was founded over 30 years ago by our current CEO/CTO, Barry Manley. Today the company is the world leader for magnetron sputtering technology for all deposition applications. Sierra Applied's cathodes offer the highest target utilization available in the industry today. All these attributes, along with Sierra Applied's pre-purchase performance & best price guarantee, makes it easy to buy. Simply put, Sierra Applied is the only name for magnetron cathode technology!


Sierra Instruments, Inc.

417

<https://www.sierrainstruments.com/>

A pioneer in the design and manufacturing of flow instruments for over 50 years, Sierra Instruments, provides advanced flow measurement and control solutions for a wide variety of global industries, including scientific research, semiconductor


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manufacturing, vacuum processes, PVD, bioprocessing, energy management, oil and gas, clean energy, aerospace, and more to help improve process efficiency, reduce waste, and lower costs. With over 150 locations in 50 countries, Sierra's people, products, and services make you smarter and more productive. We understand flow is tough, and we can help you solve your challenges. Stop by our booth, 417, to discuss your application with our flow experts.

SilcoTek Corporation**221**<https://www.silcotek.com>

SilcoTek Corporation is the leading global provider of custom coating services using chemical vapor deposition (CVD) technology. SilcoTek holds over 200 patents for coating applications and silicon-based materials that are relied upon by leading companies in semiconductor manufacturing, medical and diagnostic instrumentation, analytical chemistry, energy, and other high technology industries. Located in Bellefonte, PA, SilcoTek is a full service ISO 9001:2015 coating services provider with precision cleaning, citric passivation, custom engineering, and cleanroom packaging capabilities in-house to maximize our value to customers.

Society of Vacuum Coaters**201**<https://www.svc.org>

The SVC is a non-profit, international, professional organization primarily devoted to coating and surface finishing using vacuum processes. Our organization touches industry, academia, national research laboratories with our industrial membership including coating companies, materials suppliers, process designers, and equipment manufacturers. Our stakeholders apply coatings and treatments to a wide variety of consumer and industrial products in all business sectors and is global in perspective. These technologies are critically important to each of their technical missions.

In 2017 the SVC became an Affiliate Society of the American Institute of Physics. Our Mission is to promote technical excellence by providing a global forum for networking, educating, and informing the stakeholders, the technical community & the industrial eco-system on all aspects of industrial vacuum coating, surface engineering and related technologies. Further details are available at the SVC website: <https://www.svc.org/>

Every year the SVC holds a six-day event (which we affectionately call the TechCon) consisting of a series of tutorials, technical presentations, industrial workshops, networking events, and an international trade exhibition. Our educational program is generally regarded as the industry benchmark with over 50 in-person tutorials and almost two dozen streaming on-demand subjects. Speakers and attendees at SVC events are exposed to a broad international audience in the thin film coating and surface engineering communities.

As a community, the SVC is focused on member engagement and young member development as there is no more important mission that we can undertake. The SVC and the SVC Foundation offer extensive travel support and scholarships to students and young members in industry.

Come visit our booth to learn more about the SVC and the SVC Foundation and how you can participate and contribute to our dynamic and growing Society.

Society of Vacuum Coaters Foundation**201**<https://www.svcfoundation.org>

The Society of Vacuum Coaters Foundation was established in 2002 to realize the SVC's goal to support charitable, educational and scientific activities. As its first initiative, the Foundation created a scholarship program aimed at supporting enterprising students and practitioners who have an interest in furthering their education in the field of vacuum coating technology. The Foundation also grants travel awards to students to attend and present technical papers at the annual SVC Technical Symposium. More recently, the Foundation created scholarships for those already in industry. Since its inception, these programs have combined to award over \$500,000 to students and technical staff from around the world.

SOLBERG Filtration**919**<https://www.solbergmfg.com/en/about-us>

SOLBERG is a U.S. based, family owned, manufacturing company that engineers filtration, separation, & silencing solutions for customers around the world. Our quality filtration products improve system performance, extend lifespan and minimize maintenance. We are looking forward to connecting with you at SVC!

Soleras Advanced Coatings**512**<https://www.soleras.com>

Soleras, with a widespread presence spanning China, Europe, and the US, stands as a premier global manufacturer of sputter equipment pivotal in thin film coatings. Rooted in three fundamental pillars—equipment manufacturing, production of consumable PVD target materials essential for equipment operation, and recent strides in data analytics—Soleras is currently advancing its capabilities by developing a machine learning platform. This platform, equipped with closed-loop software control, aims to streamline equipment operation for operators.

SparkNano**220**<https://www.spark-nano.com/>

SparkNano is a high-tech product company that designs and commercializes Spatial Atomic Layer Deposition tools (S-ALD) redefining nanofabrication on an industrial scale.

SparkNano's Spatial ALD technology enables its customers to deposit thin, functional layers, thereby increasing performance and reducing costs for manufacturing fuel cells, batteries and solar cells.

The product portfolio provides advanced laboratory as well as high-throughput equipment, combined with extensive process and application support.

Exhibiting Companies

Sputtering Components

907

<https://www.sputteringcomponents.com>

With its roots in the vacuum coating industry, our design team understands the frustration that unpredictable equipment can bring. Building upon that experience, we have thousands of cathodes operating worldwide...day in, day out.

So, whether you apply thin films to glass, display or touch screens, solar panels, automobile components, decorative hardware, optics or electronics, you can be confident when you choose our rotary magnetron sputtering systems.

Our innovative products have the lowest cost of ownership. Period

Starfire Industries LLC

205

<https://www.starfireindustries.com>

Starfire Industries is a deep technology provider of precision-nanoengineered plasma-surface solutions—manufacturing IMPULSE® next-generation HiPIMS pulsed power systems and RADION™ microwave plasma sources for deposition, implant and etch. With an 18,000m2 tech dev/metrology center and plasma-material interaction physics depth across 12 patent families, our engineering team innovates bespoke in-line and batch processing solutions for challenging manufacturing problems for emerging startup R&D to worldwide high-volume manufacturing at scale.

Super Conductor Materials, Inc.

312

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<https://www.scm-inc.com>

Since 1987, SCM has successfully manufactured Sputtering targets, Crucible liners, and, Materials for the Thin Films and PVD industry. Based in New York, our components are used in the production of Semiconductors, Solar Panel Materials, Electronic Instruments, and, Optical Instruments. We provide a complete CNC Machine Shop on-site that allows us to offer Hot Press, Vacuum Hot Press, and, Vacuum Melting services. In addition, we provide Bonding, Emitter assembly support and Reclamation of many materials, including Precious Metals.

Swiss Cluster AG

205

<https://www.swisscluster.com>

Swiss Cluster develops the latest generation of thin film deposition equipment for R&D and industrial production. Our innovative designs materialize in our SC-1, the first cluster system that combines (PE)-ALD and PVD in a compact equipment. The SC Optima, a large batch ALD system tailored to the parts and coating materials to improve industrial process times and film quality. The SCube for ALD processes on a smaller scale. All our systems are powered by Swiss Cluster electronics and software for an outstanding process control and automation.

Tech-X Corporation

1016

<https://txcorp.com/>

Tech-X Corporation specializes in software and consulting services for electromagnetic, electrostatic, and plasma process modeling. Our primary software, VSim, is a particle-in-cell and fluid model with secondary processes like collisions, sputtering,

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and secondary electron emission. VSim's advanced algorithms enable the modeling of complex industrial and experimental setups for Plasma Discharge, Plasma Acceleration, Electromagnetic, Electrostatic, and Vacuum Electronics devices.

Tecport Optics, Inc.

1010
<https://tecportoptics.com/>

Tecport is an industry-leading manufacturer of state-of-the-art thin film vacuum deposition systems. Sophisticated systems employ leading edge technology such as IBS, HD Plasma Source, and Reactive Magnetron Sputtering, Ion Plasma DLC, achieving coating characteristic which has never been achieved before. Dedicated to excellence in customer service and technical innovation, Tecport has built a loyal customer base that benefits from its corporate motto, We serve to serve to serve again.

Teledyne Hastings Instruments

1012
<https://www.teledyne-hi.com/>

Teledyne Hastings Instruments is a trusted manufacturer of a wide range of quality Vacuum Instruments and Gas Mass Flow Instruments. Our vacuum product line includes the original DV-4 and DV-6 thermocouple gauge tubes, along with other vacuum sensors used in combination with meters and controllers that cover a wide range of vacuum pressure from atmosphere to ultra high vacuum. The gas mass flow line of meters and controllers cover a broad range of flow rates from 5 sccm to 15,000 slm that includes a variety of flexible options for outputs, calibration, and fittings.

Telemark

405
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Come see Telemark's new generation of Ion Beam Systems.

TELEMARK offers evaporation components, including electron beam sources, e-beam power supplies, optical monitors, cryochillers, magnetic fluid feedthrus, quartz crystal deposition controllers, ion beam systems, and related accessories. Products featured at the 2024 TechCon include our line of optical instrumentation, a new generation of ion beam systems, cryochillers, and an innovative in-situ sheet resistance monitor.

Texas Capitol Semiconductor

1015
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Thermal Conductive Bonding, Inc.

1011
<https://www.tcbonding.com>

Thermal Conductive Bonding, Inc. offers thin film coating, sputtering target bonding, and elastomer bonding and molding services. All of our processes are meticulously engineered to ensure the finest quality services in the industry. Contact TCB for all of your thin film and bonding needs.

TRUMPF Huettinger, Inc.

104
<https://www.trumpf-huettinger.com>

TRUMPF Hüttinger is continually focused on maintaining its strengths to ensure continuous development: flexibility, innovative strength, and the ability to make quick decisions. TRUMPF Hüttinger has sales and service branches in Europe, America, and Asia and has long-term objectives which can only be achieved with long-term, intensive customer relationships, or as the saying goes at TRUMPF Hüttinger: through generating confidence!

UC Components Inc.

204
<https://www.uccomponents.com>

UC Components Inc. manufactures fasteners and value-added Viton® seals for vacuum and other critical applications. Established in 1974, UC Components has been serving the semiconductor, memory, R&D, biomedical, aerospace, defense, and energy industries with exceptional quality and service for over 40 years.

Home of RediVac® Vented, Non-Vented, Coated, Plated, Electro-Polished, and Vacuum Baked Fasteners and RediVac® Cleaned and Vacuum Baked O-Rings for vacuum applications.

Universal Vacuum Technology LLC

1002
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We are suppliers of Tabletop Vacuum Coating Systems, Plasma Sources for Process Enhancement, Power Supplies for PVD Applications, High Purity Process Gas Generators, Flow & Pressure Control Instruments, Vacuum Measurement & Control Instruments, Dry Pumps, Cryo Pumps, Compressors and Rebuild Services for Cryo Pumps & Compressors. Find INTEGRITY | KNOWLEDGE | EXPERIENCE at Booth 1002

Vacuum Plus Manufacturing Inc.

1017
<https://www.vacuumplusinc.com>

Vacuum Plus Manufacturing has serviced the semi-conductor, thin film, solar, optics, aerospace, defense, automotive and nuclear industries, to name a few, for over 25 years. Vacuum Plus specializes in large stainless steel and aluminum HV and UHV chambers, manifolding and value added assemblies. We are strategically located in Chelmsford Ma., heart of the vacuum industry on the east coast. We offer engineering, design and manufacturing expertise for chambers and assemblies.

Vacuum Products Corp

812
<https://www.vacproducts.com>

Vacuum Products Corp (VPC) is a manufacturer and wholesaler of vacuum components. Our core value is manufacturing for cost reduction. We help customers to achieve cost reduction goal through engineering/design and manufacturing.

We offer materials certificates. All flanges and fittings are made from control drawings. Consistency and quality are assured. Our featured products are the valves, feedthroughs and manipulators.

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Exhibiting Companies

Vacuum Research Corporation

206

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VaporTech

1009

<https://www.vaportech.com>

Headquartered in Colorado, Vapor Technologies, Inc., (VaporTech) is one of the leading PVD coating equipment manufacturers. We work for clients in a broad range of industries globally. PVD coating systems can create coatings customized to meet your needs for friction-resistance, durability, hardness, and aesthetics. Our PVD coating equipment now includes a wide range of sizes for small operations all the way to the world's largest.

VAT Group

116

TECHCON SPONSOR <https://www.vatvalve.com>

VAT is the leading global developer, manufacturer and supplier of high-end vacuum valves. VAT vacuum valves are mission-critical components for advanced manufacturing processes of innovative products used in daily life like such as portable devices, flat screen monitors or solar panels. VAT is organized into three different reporting segments: Valves, Global Services and Industry offering high-end vacuum valves, multivalve modules, edge-welded bellows and other related valueadded services.

Veeco

1013

<https://www.veeco.com>

Veeco is an innovative manufacturer of semiconductor process equipment. Our proven ion beam, laser annealing, lithography, MOCVD and single wafer etch & clean technologies play an integral role in the fabrication and packaging of advanced semiconductor devices. With equipment designed to optimize performance, yield and cost of ownership, Veeco holds leading technology positions in the markets we serve. To learn more about Veeco's systems and service offerings, visit www.veeco.com.

Vergason Technology, Inc

804

<https://www.vergason.com>

Provider of Vacuum Metalizing Services, PVD Equipment and Processes utilizing Sputtering, Thermal Evaporation, and Cathodic-Arc. Industries served: Lighting, LED, Reflective, Decorative, Chrome Plating Replacement, Plastic Processing, Automotive, Appliance, Aerospace, Electronic, Display, Cosmetic, Packaging, EMI/RFI Shielding, Cutting Tools, Forming & Molding, and Medical. ISO 9001:2015, ITAR Registered, and RoHS Compliant.

Vital Materials

515

<https://www.vitalchem.com/business-unit/thin-film>

Vital Materials (Vital) is a global materials technology and equipment company that has been operating since 1995. With vertically integrated industrial and commercial operations spanning North and South America, Europe, and Asia, Vital Materials employs over 8,000 individuals worldwide.

Vital Thin Film Materials (VTFM), part of the Vital, is focused on the research, development, production, sales, and recycling of sputtering targets and evaporation materials for physical vapor deposition (PVD).

VST Services, LTD.

915

<https://vacuumltd.com/>

Vacuum System Technologies (VST) has been at the forefront of vacuum system technologies since 1982, providing cutting-edge solutions such as gloveboxes, thin film deposition systems, vacuum ovens, ARC-Melting systems, and aerospace altitude test chambers. VST's tailored solutions cater to diverse industries, including electronics, optics, semiconductors, energy, medical, defense, and nanotech. Renowned for its innovative and reliable custom solutions, VST collaborates with industrial and educational leaders.

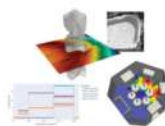
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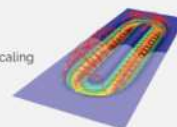


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**SOCIETY OF VACUUM
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Education Program
May 17 – May 22
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Advance Exhibit/Booth Registration

The Advance Booth Reservation Process enables 2024 exhibitors to reserve the best available booth (or booths) for the next SVC Exhibit, using the number of exhibitor points that they have accumulated. The current Point System will still apply for 2025. The exhibiting company contact will be presented with a 2025 Exhibit contract when the 2025 Exhibit Hall Layout has been finalized.

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2025 TechCon Advance Booth Reservation Form

10 foot x 10 foot booth \$3,195 USD

Booth fee increases to \$3445 USD on September 14, 2024.

The Second Wave of Booth Assignments will apply to booth reservations received between July 13, 2024 and September 13, 2024.

Full payment by credit card or company check is required for a complete booth application.

Booth registration form can be sent by fax to 866-577-2407 or by E-mail to jacque.matanis@svc.org.

Mail checks to SVC, PO Box 10628, Albuquerque, NM 87184-0628 USA

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Booth Fee Includes: 8 foot high backwall, 3 foot high dividers, booth ID sign, 500-character listing in the 2025 TechCon Program/Exhibit Guide, 2,000-character exhibitor profile in the 2025 online exhibit floor plan.

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Founded in 1953, AVS is a nonprofit, professional membership organization with 5,000 members worldwide. AVS fosters networking among many scientific communities at various local, national, or international meetings and exhibits throughout the year. In addition, AVS annually publishes four journals, honors and recognizes members through its prestigious awards program, provides training via the short course program, and offers several career services. Learn more about AVS at www.avs.org!

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HIPIMS 2024 will provide a forum for presenting the latest research by scientists and engineers from industry, engineering institutes and academia. Contributions will cover fundamental scientific aspects as well as application-oriented research and development. In addition, successful introduction to market of new products utilizing HIPIMS will be addressed. <https://www.hipimsconference.com/>

European Society of Thin Films

The European Society of Thin Films (EFDS) is a non-profit organization active in the industrial field of thin-film technologies. The office is in Dresden – right at the heart of the European semiconductor industry and a major center of vacuum equipment manufacturing. The EFDS also manages the International Conference on Plasma Surface Engineering, a biennial conference series held in Gar-misch-Partenkirchen, Germany. <https://www.efds.org/de/>

10th International Symposium on Functional Coatings and Surface Engineering (FCSE 2024)

The 10th International Symposium on Functional Coatings and Surface Engineering will take place in Montreal on June 2-5, 2024. The Symposium program includes Invited lectures of leading experts; oral and poster original presentations; short courses; workshops on coating characterization; an exhibit; and discussion and networking sessions. Join us in Montreal! <https://www.fcse-montreal.ca/>

International Symposium on Sputtering and Plasma Processes (ISSP 2024)

The International Symposium on Sputtering and Plasma Processes was established in 1991. The symposium, organized by the Japan Society of Vacuum and Surface Science, is held biennially. At each symposium, the current topics and trends concerning sputtering and plasma processes have become the main focus and such topics have been discussed intensively. In Kyoto in 2024, the focus will be on discussion towards sustainable developments. <https://www.issp-jvss.org/>

Association for Roll-to-Roll Converters

The Association for Roll-to-Roll Converters (ARC), formerly AIMCAL, promotes the converting industry and its members and delivers an array of services focused on providing cutting-edge science and technology through top-tier technical training and education and the most comprehensive library of technical resources in the converting industry. Headquartered in Greenville, South Carolina, USA, membership of the global group stands at more than 300 companies. More information is available at: <http://www.rolltoroll.org>.



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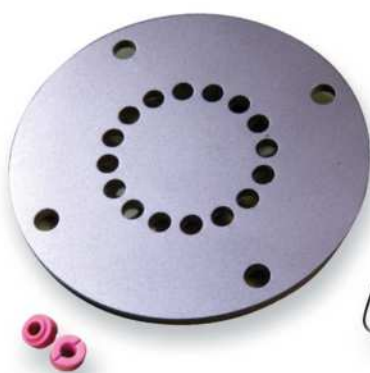
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