

MESSAGE FROM THE DIRECTOR

Greetings Smart Manufacturing Community!

The highlight for this quarter was the [Global Smart Manufacturing Conference \(GSMC\)](#) and the **first one that focused entirely on the Smart Manufacturing (SM) roadmap vision** that's coming into focus through the tremendous effort of the global Smart Manufacturing community.

Kudos to Michael Arnold (PEER Group), James Lin (UMC), Holland Smith (Inficon), Bobby Mitra (TI), and John Behnke (Inficon) as program committee of the GSMC program, who did an outstanding job of putting together the programming, organizing, and moderating the sessions. A big thank you too to a wonderful lineup of speakers, GSMC sponsors (Advantest, Inficon, and Minds.ai) and the SEMI team for their tremendous effort in successfully pulling together such a unique virtual conference.

As we wrap up 2022, I would also like to thank all the SEMI members who make up the Smart Manufacturing chapters in every region around the world for their tireless work in moving the initiative's efforts forward. **It has been a tremendous year with many highlights!**

- SEMICON West'22 - Well received and attended Smart Manufacturing pavilion with 5 sessions and 25 speakers including a special SEMI session previewing AI Factory of the Future
- GSMC 2022 - Strong lineup of speakers with insightful and actionable content focusing on the 5 key technology stages towards realizing an autonomous factory. Key takeaways are shared below.
- Guidelines committee launched a great resource for the SM community - Industry 4.0 Readiness Assessment Model (IRAM)
- Smart Manufacturing Standards ([Smart Manufacturing Standards | SEMI](#)) – a comprehensive list for easy access
- Smart Manufacturing Surveys (please take the survey and make your voice heard)
- [EDA-Interface A](#) survey in Nov'22
- [Autonomous Factory Survey](#) in Dec'22

What's in store for 2023?

Moving into 2023, we have a grand challenge related to future semiconductor manufacturing – specifically, **"How do we translate the Smart Manufacturing Roadmap vision into actions to make the entire product life cycle more efficient, productive and sustainable?"** The US CHIPS for America Act, European CHIPS Act, and other efforts offer a tremendous opportunity to transform the semiconductor industry in line with the GEC roadmap vision but this requires dedicated effort to identifying and removing barriers to fully Autonomous Smart Future Factories! The SEMI Smart Manufacturing Initiative will work towards addressing this challenge and I invite you to participate! Looking forward to a fun and exciting 2023!

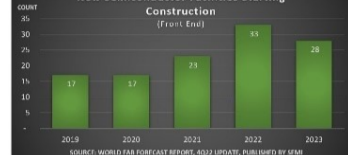
Wishing you and your families Happy Holidays and a wonderful New Year!



Mark da Silva
Senior Director



FEATURED ARTICLES



Global Chip Industry Projected to Invest More Than \$500 Billion in New Factories By 2024

The projected growth in global factory count includes a record high 33 new semiconductor manufacturing facilities starting construction this year and 28 more in 2023.



Sweeping AI and Cybersecurity Laws Risk Disruptions to European Union Businesses

James Amato of SEMI shares an overview of the proposed EU recast of the Machinery Directive into the Machinery Products Regulation and Artificial Intelligence Regulation (AIR) proposal. SEMI members are encouraged to coordinate with the SEMI EHS division to develop additional working groups.



Driving Toward Net-Zero – Key Takeaways from Semiconductor Sustainability Summit at SEMICON Taiwan 2022

With its oversized carbon footprint, semiconductor manufacturing will play a key role in helping the world meet net-zero goals by mitigating its GHG emissions. Read on to explore themes around advanced manufacturing, renewable and alternative materials for green manufacturing and the recently established SEMI Taiwan Sustainable Manufacturing Committee.



Introduction To SEMI Communication Standards: SECS/GEM

This article provides an overview of what SECS/GEM and GEM300 are, and introduces them to the SEMI Communications Standard, for those of you who are starting SECS/GEM and GEM300.



Adding More Data Isn't the Only Way to Improve AI

Highlights from a Harvard Business Review article by Pushkar Apte of SEMI and Costas Spanos of University of California, Berkeley that identifies keys for data-driven AI initiatives in business to fulfill their promise.

REGIONAL CHAPTER NEWS

Global

The **Global Executive Committee (GEC)** held its bi-monthly meeting on Oct 13th, 2022. The main topics of discussion were the GSMC 2022 conference, Industry 4.0 Readiness Assessment Model (IRAM) rollout, and how best to achieve the CHIPS for America goals through deployment of Smart Manufacturing tools and technology.

The GEC requested launch of an Equipment Data Acquisition (EDA) survey to assess the status of experience with SEMI EDA standards suite to guide current and future initiatives that improve its capabilities and foster broader adoption. The survey was distributed to 200mm and 300mm fab manufacturing & equipment experts. The content of the survey is categorized into 5 parts

Manufacturing Stakeholders

- Manufacturing KPIs (Operational Performance)
- Manufacturing Application Support
- Automation Requirements & Equipment Acceptance
- Current (on Intended) Usage
- Issues & Expectations

Link to survey [SEMI Equipment Data Acquisition / Interface A Standards Survey – Questionnaire on Usage, Requirements, Expectations, & Issues](#)

The final GEC meeting for the calendar year was held on December 13th, 2022.

Americas



Introducing the New INDUSTRY 4.0 READINESS ASSESSMENT MODEL (IRAM)

Exciting news! Last month at the Global Smart Manufacturing Conference, the Americas Chapter launched an assessment model to help organizations assess their Industry 4.0 technology deployment progress. Developed through a collaboration of SEMI and industry experts (Guidelines Sub-Committee), the model is intended to guide companies across the semiconductor supply chain to identify technology enhancements critical to scaling and sustaining their smart manufacturing transformation. **We encourage you to download the model to self-assess and share feedback at smartmfg@semi.org.**

Taiwan

Through 2022, the SEMI Taiwan Smart Manufacturing Committee has continued to drive initiative efforts forward. The pilot run of the **AI-Driven Autonomous Factory of the Future** questionnaire was successfully completed, a **new member (Cheng Mei Instrument Technology Co., Ltd)** was added to the committee, and the Smart Manufacturing Forum (SMF) 2022 event, conducted during SEMICON Taiwan was a success.

China

Through 2022, the SEMI China Smart Manufacturing Committee has continued to grow.

Although SEMICON China was postponed due to ongoing pandemic constraints, the SM initiative in China successfully added **new members (Wuxi Xinxiang Information Technology Co., Ltd, Shanghai Sharktek Technology Ltd. & ABB (China) Ltd.)** and the SEMICON China 2022 - Smart Manufacturing Forum (SMF) 2022 event was held on Nov 1, 2022.

RECENT EVENTS

Smart Manufacturing Forum @ SEMICON Taiwan 2022 | September 14th, 2022

SEMICON Taiwan held the Smart Manufacturing Forum (SMF) on September 14th. The theme of the forum was the AI-Driven Factor of the Future, and brought together Smart Manufacturing **solution providers, system integrators, software and hardware vendors** and Smart Manufacturing **demand side players** across the electronics & high-tech manufacturing industry.

Speakers from Micron, Lam Research, Microsoft, Rockwell Automation, AWS, Siemens and Dell Technologies helped participants explore the prospects and challenges of AI-driven smart factories.



Smart Manufacturing Forum | November 1, 2022, | Shanghai, China



The SEMICON China 2022 -Smart Manufacturing Forum (SMF) sponsored by Lam Research, Huawei, IKAS, Getech Technology (TCL), FurureFab.ai, was held November 1, 2022 with over 150 attendees and speakers from Amkor, Lam Research, Schneider, Huawei, IKAS, Getech Technology (TCL), & FurureFab.ai

Global Smart Manufacturing Conference | November 8-10, 2022 | Virtual

More than **35 global industry 4.0 experts** gathered virtually for the 3rd annual GSMC to share insights into state-of-the-art technologies and strategies designed to drive higher product quality, enhance production efficiencies, and improve electronics manufacturing sustainability. Spread across 3 days and 2 time zones, the event saw **230+ attendees engage in six intelligent sessions** that were packed with expertise, ideas, and solutions for making manufacturing smarter.

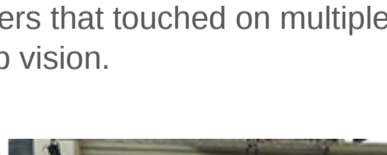
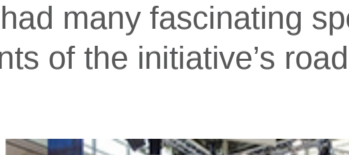
The event kicked off with a keynote on Factory of the Future and finished strong with the launch of the Industry 4.0 Readiness Assessment Model (IRAM). The key takeaways from the conference are captured in the table below.

Session Topic	Key Points
Acquire	<ul style="list-style-type: none"> • Data Visibility & Digitization are key • Streaming Data requires architecture, connectivity & security standards – Innovations needed (architecture, structure of data etc.) and more R&D in interoperability, & security
Insights	<ul style="list-style-type: none"> • Novel point solutions in metrology, image analysis for advanced nodes, back-end big data analytics, and alternate standards • Full Unit level traceability with progress towards capture of all events and process steps.
Digital Twin (DT)	<ul style="list-style-type: none"> • DT Framework (ISO23247) for semiconductor legacy equipment • Fast Dynamic model generation for DT that combines reduced order, & data, & physics based • DTs for BEOL to improve DfM
Prediction	<ul style="list-style-type: none"> • Deploying AI/ML for Predictive APC and taking AI from decision support to high level control (Advanced Time-Series AI, Semi-supervised and reinforcement learning gaining traction in fabs) • Predictive methods for sub-fab & back-end to predict yield and ROI use cases
Autonomy	<ul style="list-style-type: none"> • Full Control room for wafer ops towards lights-out factory • Additional sensors being deployed towards autonomous control • Reduce human intervention with autonomous control in back-end FDC and material transport
Foundational Topics	<ul style="list-style-type: none"> • End to end sustainability roadmap accelerated with Smart Manufacturing • Current state of Cybersecurity & Digital Resilience • SEMI Americas SM Guidelines WG launched maturity model (IRAM) and has requested evaluation

Smart Manufacturing @ SEMICON Europa 2022 | November 15-18, 2022 | Munich, Germany



SEMICON Europa 2022 was held on Nov. 15-18 in Munich, Germany and was by all accounts a very successful event. Of interest to the Smart Manufacturing community, there were the SEMI International Standards meeting, Future of Work Forum, Advanced Packaging Conference (APC), Fab Management Forum (FMF) and the Smart & Green Manufacturing Summit, which had many fascinating speakers that touched on multiple elements of the initiative's roadmap vision.



UPCOMING EVENTS



Smart Manufacturing Forum @ SEMICON Japan 2022 | December 14-16, 2022 | Tokyo, Japan

A must-attend show that connects technologies in the digital transformation era. **Co-located with Advanced Packaging and Chiplet Summit (ACPS)** this year, SEMICON Japan brings together not only the whole semiconductor manufacturing supply chain, but also the "SMART" applications powered by semiconductor technology, such as automotive and IoT.



Introduction to Implementing a Test Cell RITdb Client | January 18, 2023 | Online

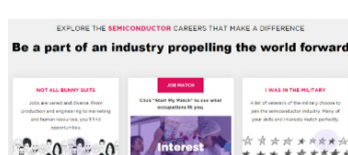
Looking to take advantage of Industry 4.0 to bring order to the chaos of your semiconductor test process? Attend this course to learn how an implementation of the latest SEMI Standard for test floor data and events sharing can improve the productivity of your test operations.



Smart Manufacturing Forum at SEMICON Korea | February 1, 2023 | Seoul, Korea

This forum is a prestigious event, organized to provide an international platform for researchers, engineering managers, and industrial participants to share the industry state of the art in Smart Manufacturing. You'll hear global experts share strategies and best practices to improve manufacturing data capture and analysis. Register today and generate ideas to help in maintaining business continuity and meeting the increasing demands of customers.

HELPFUL RESOURCES



SEMI Career Portal – Free for SEMI members

The new SEMI Career Portal is a unique place for students, veterans, and job seekers to explore the many careers available in the microelectronics value chain. The portal includes links to positions open at SEMI member companies and provides a wealth of information, including videos from industry professionals, education opportunities, and pathways to creating a successful career in microelectronics. **Complete the online application form to add your company/organization to this exciting industry resource.**

SEMI Advertising Opportunities Available

SEMI Global Update, SEMI.org, Regional Newsletters, Smart Manufacturing Newsletter and more. For more information please contact: Eric Rude, SEMI erude@semi.org

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