

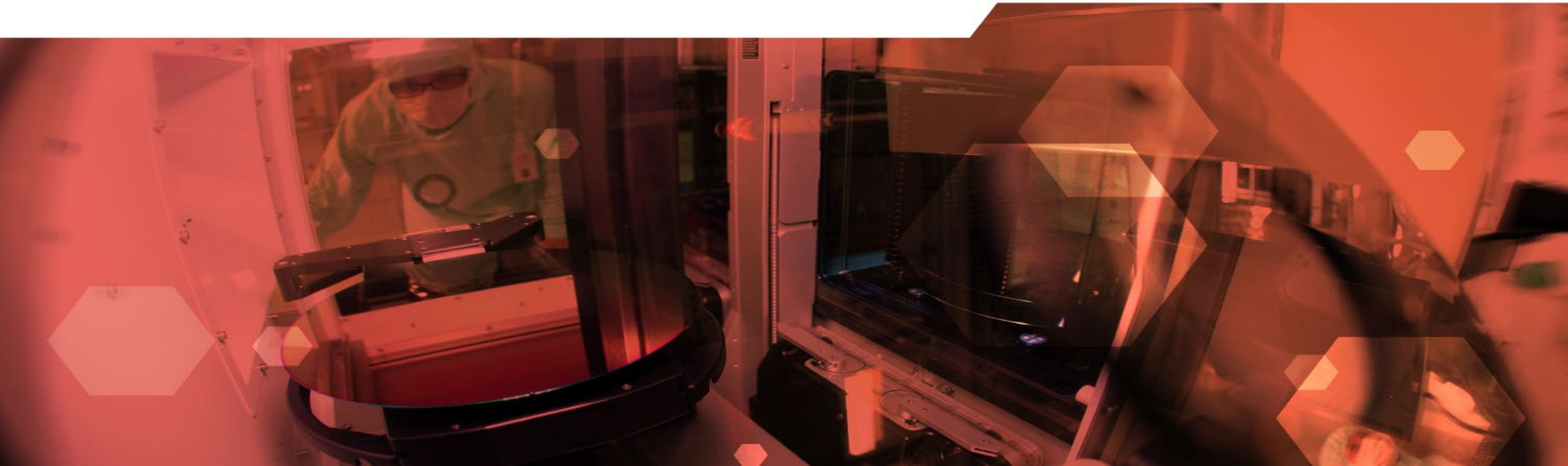


SEMI BIM Task Force SEMIcon West

06-December-2021

Michael Potts, PE, LEED AP BD+C, CxA

Task Force Lead



Agenda

- SEMI Required Elements (5 mins)
- Welcome & Introductions (5 mins)
- SEMI BIM Task Force Overview (10 mins)
- 6628A SEMI Draft Doc Review (45 mins)
- 6628A Doc Next Steps (5 mins)
- Action Items/Decisions/Discussion (15 mins)
- Next Meeting(s) and Adjournment (5 mins)

SEMI Standards Required Meeting Elements

Rev6 – June 2020

Outline

- Program Membership Requirement
- SEMI Antitrust Reminder
- Intellectual Property Reminder
- International Meeting Guidelines

SEMI Standards Program Membership Requirement

- To participate in a SEMI Standards meeting, a person must be a SEMI Standards Program Member
(*Regulations* ¶ 1.5.2)
- This ensures that all meeting attendees have agreed to abide by the *Regulations*.
- If you are not a Program Member, please proceed to the Standards Information Desk and complete a SEMI Standards Program Membership application.
 - Also available at: www.semi.org/standardsmembership

SEMI Standards Antitrust Reminder

- SEMI Standards activities are a coordinated effort among competitors in the semiconductor, FPD, PV and other related industries. Accordingly, every effort must be made to avoid even the appearance of impropriety.
- Do **NOT** discuss or participate in topical areas such as:
 - Pricing, purchasing, or marketing of either a company or of specific products
 - Industry or customer allocation, production, or capacity
 - Topics that might result in undue bias for or against one or more companies or products
- If any participant has a question as to the legality of a proposed course of action, the matter should be immediately referred to SEMI Staff

Intellectual Property Reminder [1/2]

- When possible, SEMI Standards and Safety Guidelines should be written in such a way that patented technology, copyrighted items, or trademarks is not necessary to use, comply with, or implement the Standard or Safety Guideline.
- All Program Members are responsible to make known any
 - patented technology,
 - published patent applications,
 - copyrighted items, and
 - trademarkswhich may be required to use, comply with, or implement the Standard or Safety Guideline being developed.

Contact SEMI Staff if you are unable to publicly announce or discuss known intellectual property

Intellectual Property Reminder [2/2]

- Intentional concealment of any intellectual property, *while knowing it could have an effect on the document under development*, may render the intellectual property rights unenforceable in the future.
- See Section 16 of the *Regulations* for more information.

Contact SEMI Staff if you are unable to publicly announce or discuss known intellectual property

International Effective Meeting Guidelines

- Leader or meeting facilitator should formally welcome any international guests
 - Invite participants to take part in the discussions
- Raise one's hand (or otherwise indicate, especially if participating via Virtual Meeting) and wait to be named to express an opinion;
- Avoid words unique to a Locale;
- If an interpreter is used, make appropriate pauses;
- Treat each other with respect (no interrupting, talking over another, etc.)
- Speak slowly, clearly, and address entire audience to allow all participants to hear and understand
- State your ideas concisely
- Summarize your comments with a result or request
- **Virtual Meeting participants should mute their audio lines when not speaking**

Welcome & Introductions

Attendees

▼

Participants (7)

Q Find a participant

MP

Michael Potts,... (Me)

Mute

More >

SW

SEMICON West Room 306 (Host)

CS

Carolyn Sutton - Nikon Precision

CV

Christophe Vivensang (Lam)

ES

Eric Sklar, Safety Guru, LLC

RM

Russell Martin (Lam Research)

SM

Supika Mashiro

In the room:
Laura N.
Mohammed Saleem
Christine Yoo/Lam

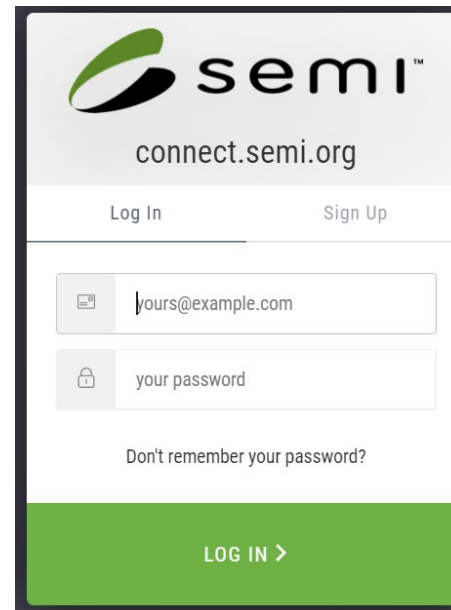
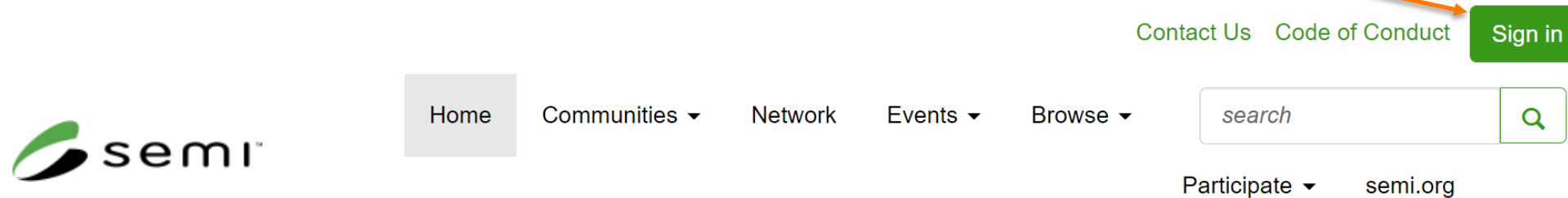
SEMI BIM Task Force Overview

SEMIconnect

SEMIconnect is the central information, collaboration, communication, and community hub

<https://connect.semi.org/home>

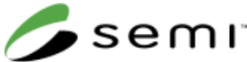
Click here to sign in





SEMI BIM Task Force on SEMIconnect

SEMIconnect is the central information, collaboration, communication, and community hub

[Link to SEMIconnect BIM Task Force site](#)




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Building Information Modeling (BIM) for Semiconductor Capital Equipment Task Force

 Settings

 Standards Program Membership >> Facilities

Community Home

Discussion 1

Library 12

Events 0

Members 7

1 to 1 of 1 threads (1 total approved posts)

Most Recently Updated ▾

Posts in my communities ▾

50 per page ▾

Post New Message

Thread Subject	Replies	Last Post	Status
★ SEMIcon West	0	5 days ago by Michael Potts	

SEMI BIM Task Force Overview

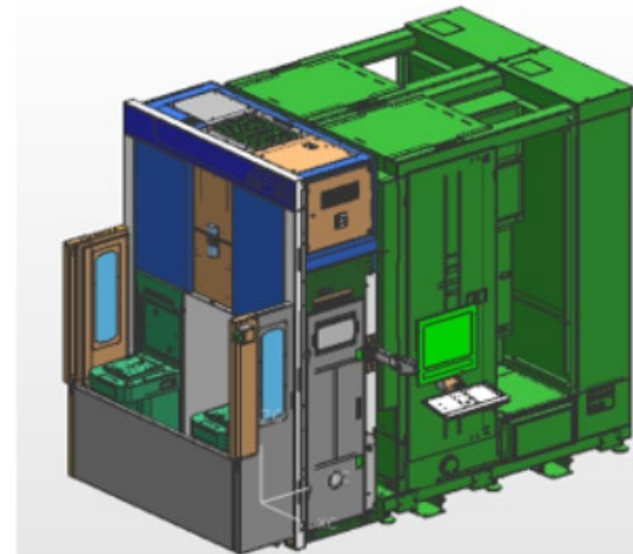
<http://prod7.semi.org/en/building-information-modeling>

Building Information Modeling

By: Laura Nguyen

The Building Information Modeling (BIM) for Semiconductor Capital Equipment Task Force, part of the North America (NA) Facilities Technical Committee Chapter, was formed to gather input from equipment suppliers to create a common format for BIM software. It is a three-dimensional model that works with multiple software applications. This model needs to reflect the true dimensions of a semiconductor fabrication tool and show the x, y, z location of each interface point. This will allow the user to build virtual models of their entire fab, optimize layouts, and plan all of the facilities requirements—from routing to sizing of all of the equipment supplies.

This effort is being driven by some of the largest semiconductor companies in the industry, as the benefit of BIM will be substantial when designing new fabs or optimizing existing fabs. By providing the industry with a common format that works for all semiconductor manufacturers and all BIM software, equipment manufacturers will only have to create one BIM model per equipment configuration. Without a common format, it would take several hundred man-hours to build such a model, which would be extremely impractical.



SEMI BIM Task Force Overview

SEMI Draft Document 6628A

New Standard: GUIDE FOR FACILITIES DATA PACKAGE FOR SEMICONDUCTOR MANUFACTURING EQUIPMENT INSTALLATION AND BUILDING INFORMATION MODELING

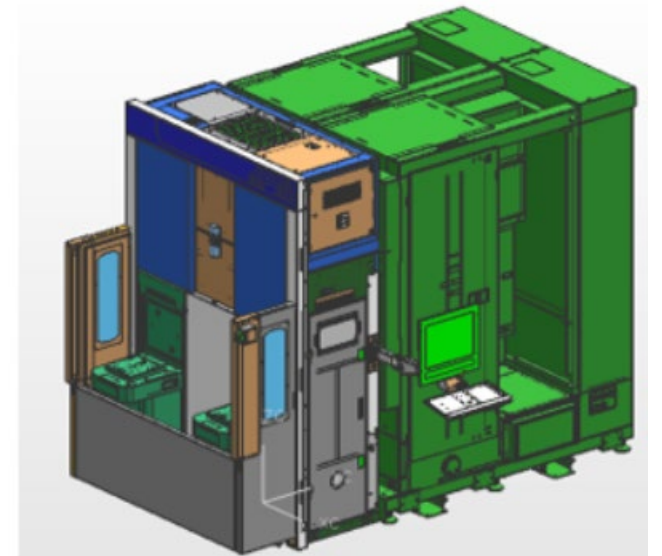
Background

Semiconductor manufacturers are asking equipment suppliers to provide input for Building Information Modeling (BIM) software and the industry needs a standard input format that will work with multiple software applications (there are at least three software companies that work in this space.) This is the latest trend in facilities planning.

Relying upon other SEMI facilities standards (SEMI E6, E51, E70, E72) as a guide, this document creates a standard BIM model format referred to as a Facilities Data Package (FDP) in this document. Within the FDP is a simplified 3D model (shell or solid) of a given piece of equipment with utility points of connections and/or interconnect information (water, power, gas, exhaust, etc.) defined in the model. The model needs to reflect the true dimensions of the equipment and show the x, y, and z location of each interface point. It is also expected to contain utility information about idle, typical, and maximum usage of each interface point currently defined in SEMI E6. This allows the user to build virtual models of their entire fab, optimize layouts, and plan all of the facilities requirements (routing and sizing of all of the equipment supplies).

The benefit of BIM to the semiconductor manufacturers is large when designing new fabs or optimizing existing fabs, and this effort is being driven by some of the largest semiconductor companies. With a common input format that works for all equipment manufacturers and all BIM software, the equipment manufacturers will only have to create one input dataset for each equipment configuration. The BIM software can then use this input to create the BIM model requested by the semiconductor manufacturers. It can take several hundred man-hours to build such a model and this would become impractical without a common input format. Semiconductor manufacturers that don't currently plan on using a BIM model will find the FDP more useful than previous information because it contains more details necessary to install the equipment.

NOTE: Changes made to this document from the previous version include changes to the wording: to clarify the scope, to clarify what equipment is being referred to, to eliminate reference to NEC specific documents, to correctly locate abbreviations and terminology, and to modify the document to use metric units.



Smart Manufacturing (Processes & Product) is defined as the use of production and sensor data with manufacturing technologies to enable adaptability in process.

Definitions

Building information modeling (BIM) is a process involving the **generation** of digital representations, including, 2D blocks, 3D models, data of physical and functional characteristics of equipment, systems, buildings, sites, and people.

SEMI Draft Document 6628

New Standard: GUIDE FOR FACILITIES DATA PACKAGE FOR SEMICONDUCTOR EQUIPMENT INSTALLATION AND BUILDING INFORMATION MODELING

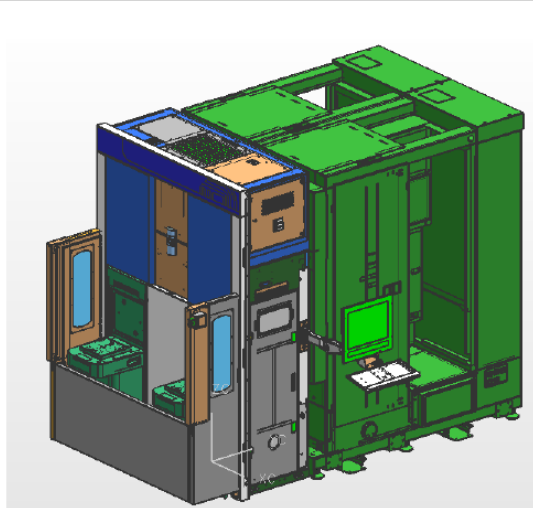
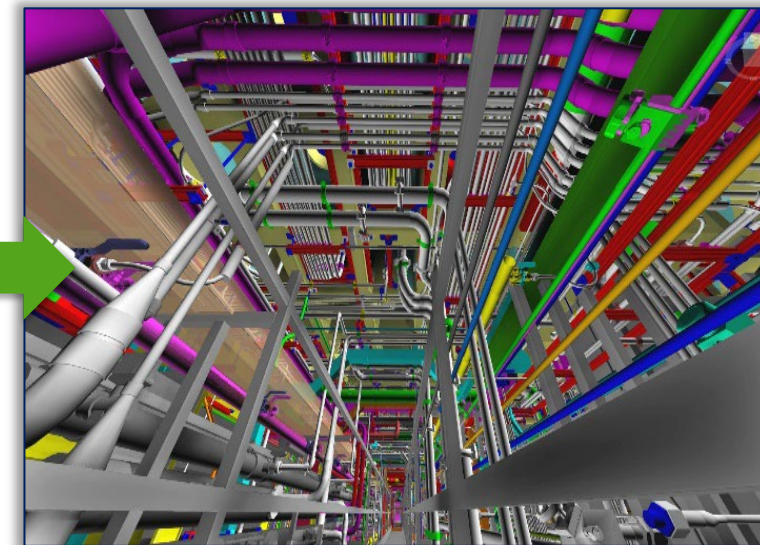
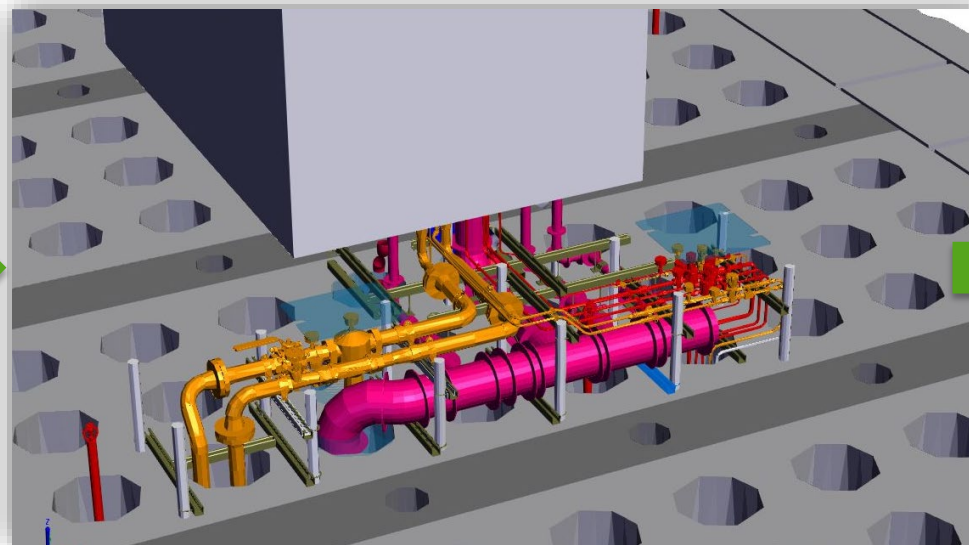


Figure 1
Sample of a 3-D Model Shell



Definitions

Virtual Design and Construction (VDC) is the **integration** of multi-disciplinary BIM models for design-construction projects, including the processes and systems of the AEC partners and FOA Factory and Facilities Design - Construction - Operation teams.

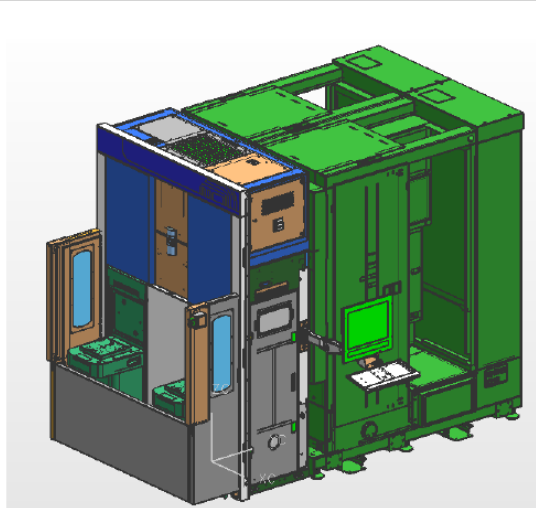
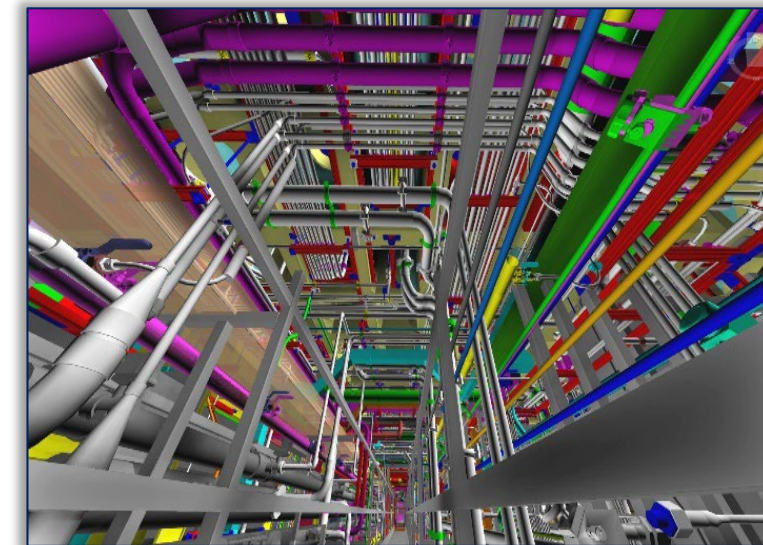
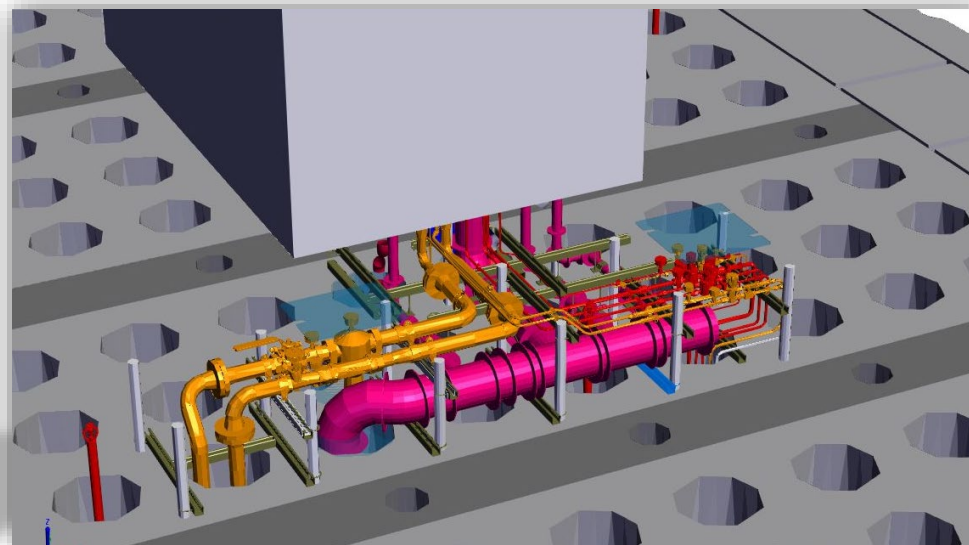


Figure 1
Sample of a 3-D Model Shell



Definitions

Digital Twin is a digital replica of potential and actual physical assets (physical twin), equipment, systems, buildings, sites, people, and associated data that can be used for various purposes, including **real-time data reporting, predictive analytics, and simulation**. The digital representation (twin) provides both the elements and the **dynamics** of how an **Internet Of Things (IoT)** device operates and lives throughout its life cycle [IBM Watson]. **FOA systems integration**.

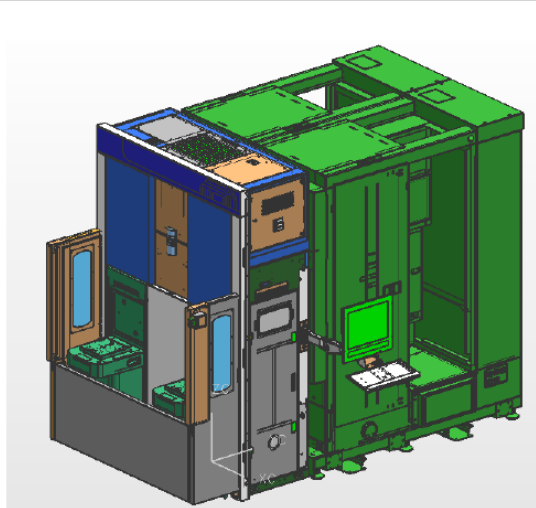
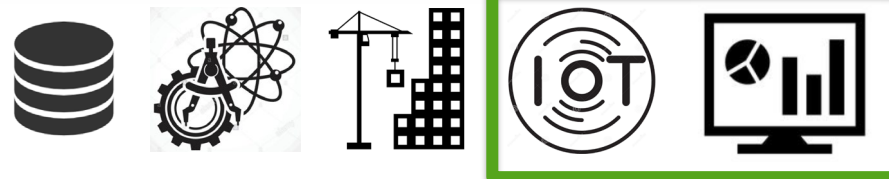
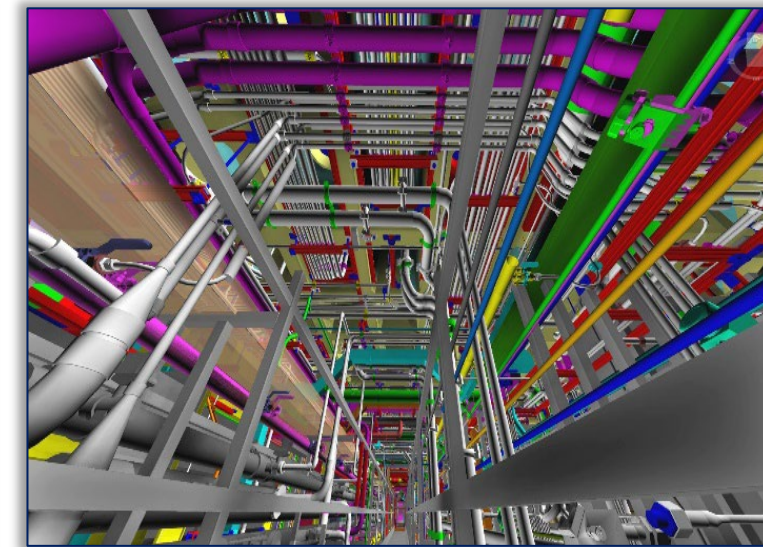
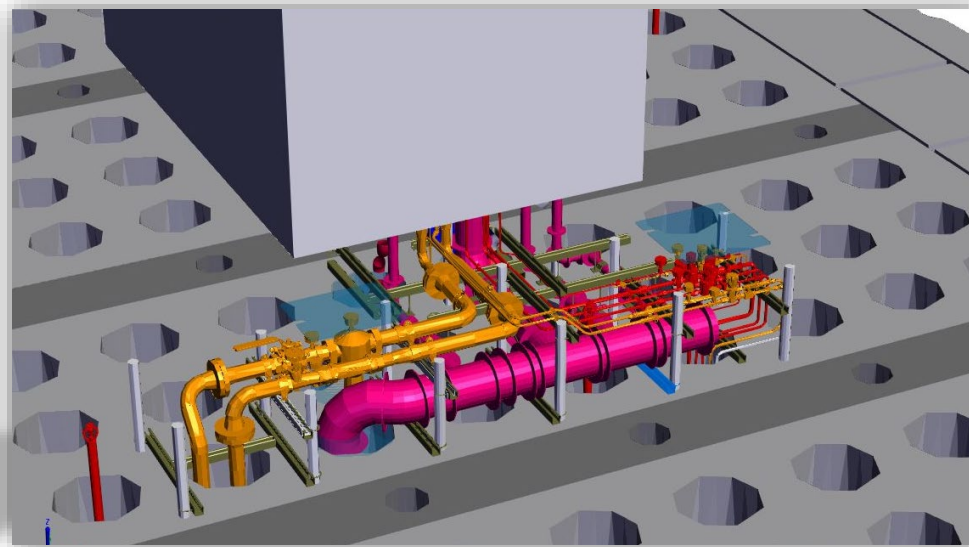


Figure 1
Sample of a 3-D Model Shell



SEMI Smart Manufacturing

Applied to BIM, VDC, And Factory Digital Twin

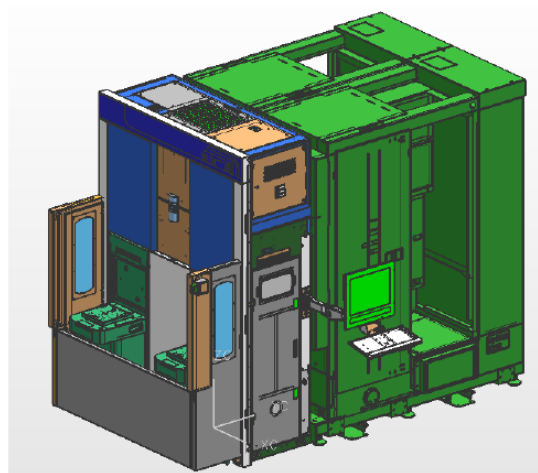
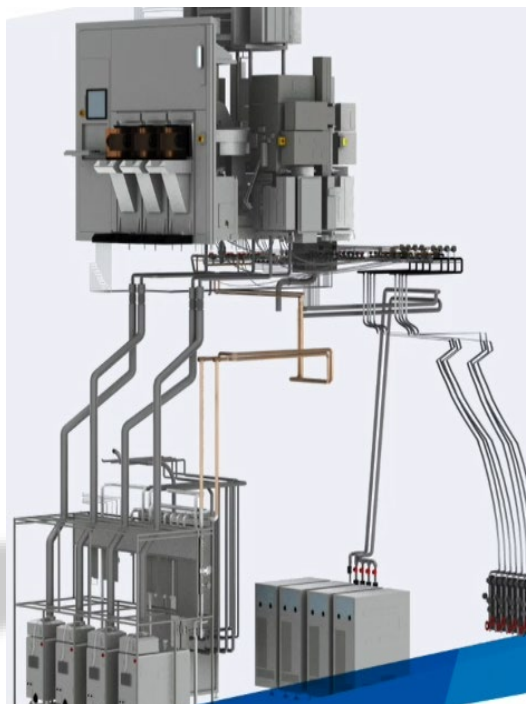
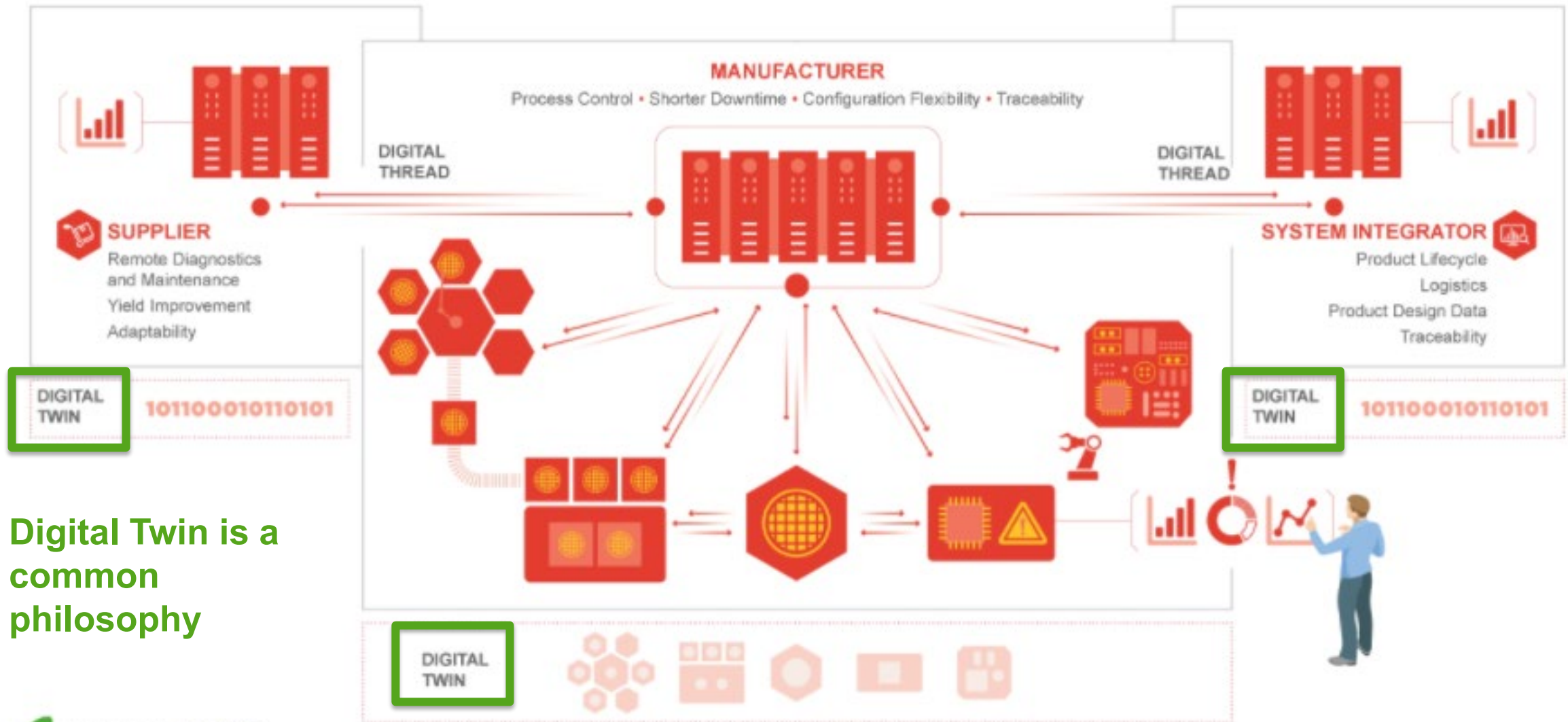


Figure 1
Sample of a 3-D Model Shell



SEMI Smart Manufacturing

Smarter Manufacturing Through Actionable Data



Digital Twin is a
common
philosophy

SEMI Smart Manufacturing + SEMI Facilities BIM

Holistic Ideal State

Smarter Manufacturing Through Actionable Data

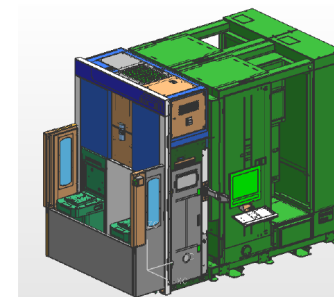
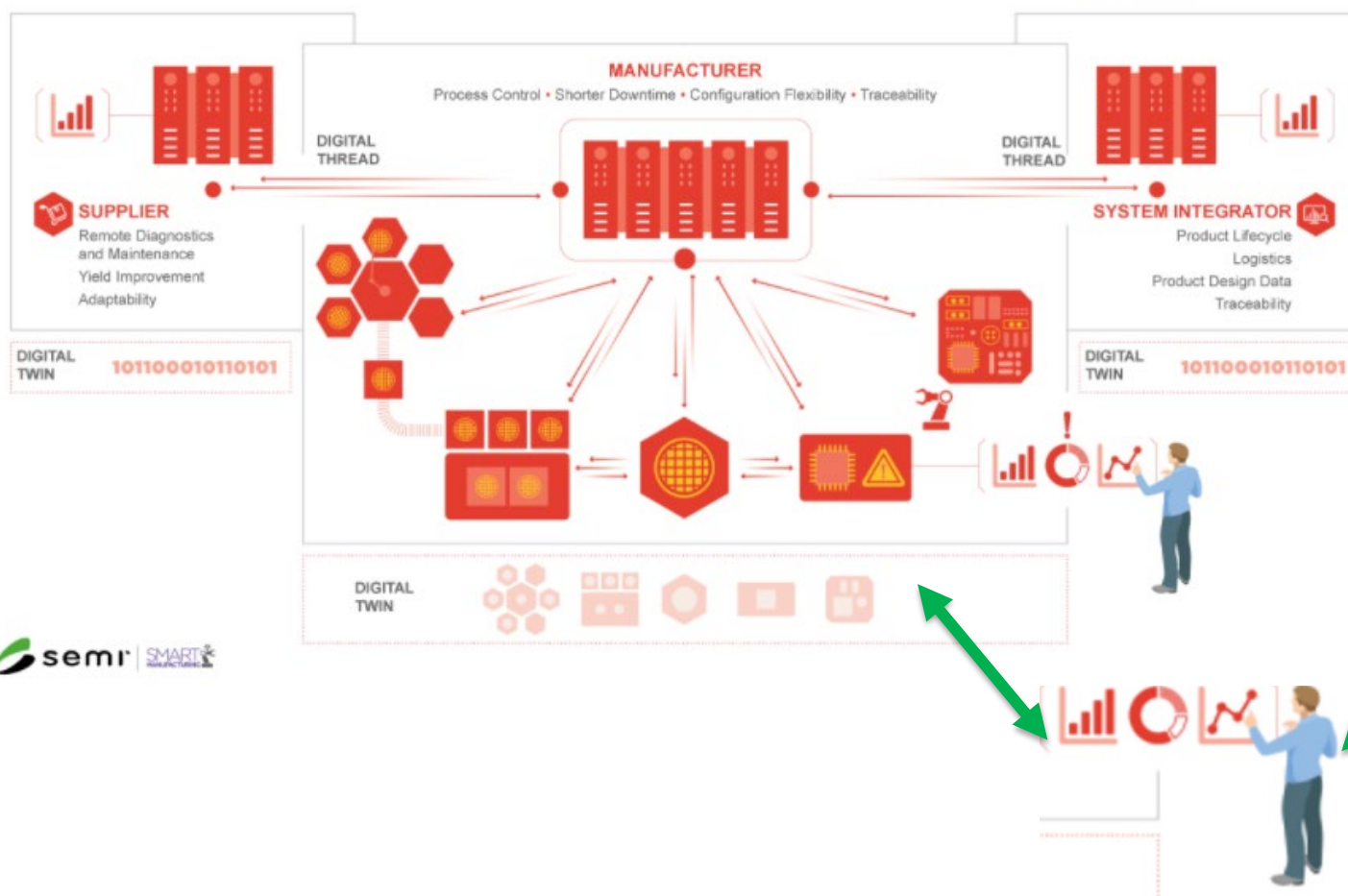
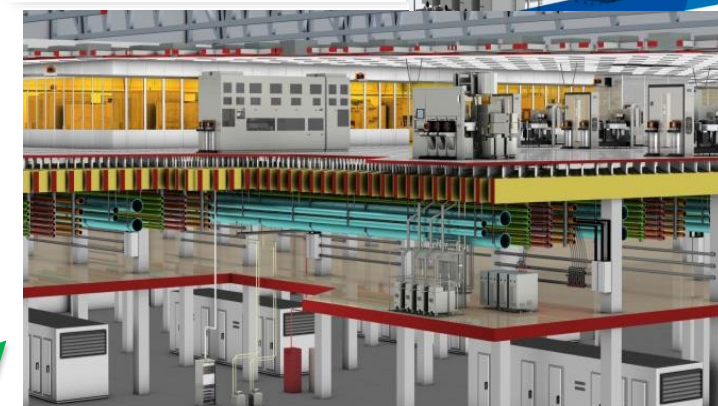
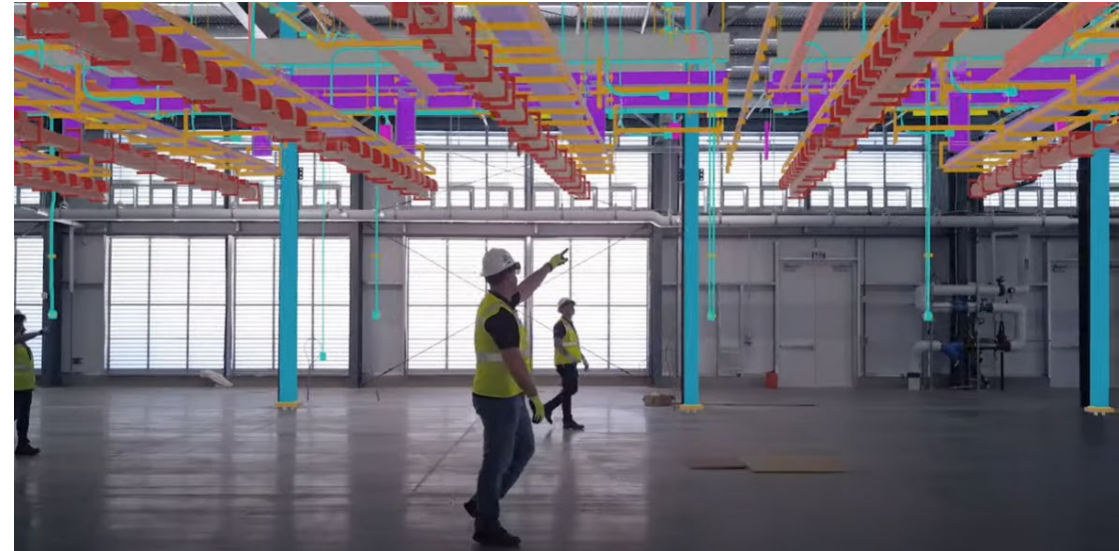


Figure 1
Sample of a 3-D Model Shell



SEMI Digital Twin/BIM Use Case

Augmented Reality w/ BIM Field Overlay



Credit: Next Reality (with Microsoft Hololens/Unity Visual Live Youtube embedded)

<https://hololens.reality.news/news/microsoft-debuts-hololens-2-industrial-edition-for-pharmaceutical-semiconductor-enterprise-users-0384296/>

SEMI Digital Twin/BIM Use Case

Intel Takes Us Inside to Reveal How HoloLens 2 Is Transforming Computer Chip Production



Credit: Next Reality

SEMI Digital Twin/BIM Use Case

Augmented Reality

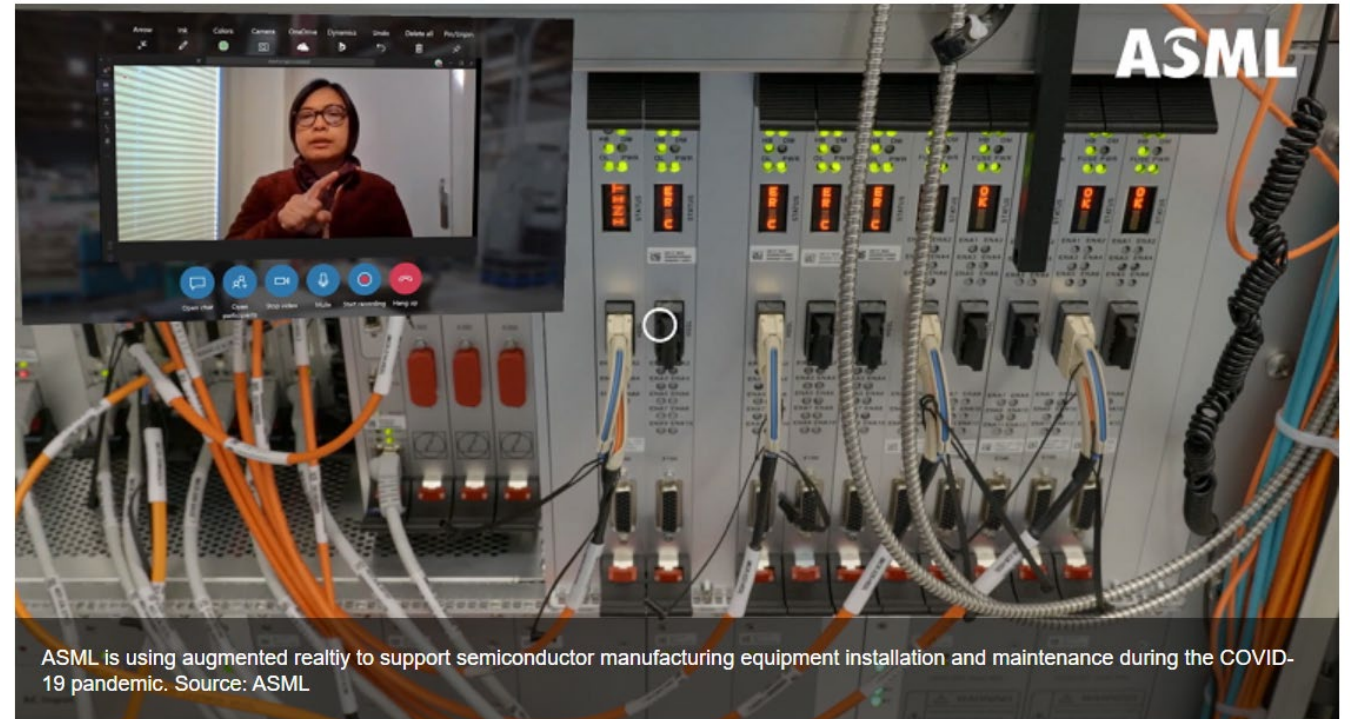


Semiconductor Equipment

Using augmented reality to install and support semiconductor equipment in the COVID-19 era

Peter Brown

21 July 2020



ASML is using augmented reality to support semiconductor manufacturing equipment installation and maintenance during the COVID-19 pandemic. Source: ASML

Credit: Electronics 360

<https://electronics360.globalspec.com/article/15458/using-augmented-reality-to-install-and-support-semiconductor-equipment-in-the-covid-19-era>

6628A SEMI Draft Doc Ballot Review

6628A SEMI Draft Doc Ballot Review

- <6628A SEMI Draft Doc.docx>

6628A SEMI Draft Doc Next Steps

6628 SEMI Draft Doc Next Steps

- Finish reviewing and resolving open 2021 ballot comments
 - Dec 2021, before holidays: MP and ES to resolve what they can outside of TF
 - Pull in other TF members (CV, EP, SM, LN, SL) as needed
 - Hold additional worksession virtual meetings if needed.
- Full Task Force review and closure in 12-Jan-2022 meeting.
- One week final TF review 14-Jan-2022 to 21-Jan-2022
- First re-ballot target Cycle 2 Ballot
 - Submission 1-Feb-2022 submission
 - Voting Open on 15-Feb-2022
 - Voting Closes on 17-Mar-2022
- Spring meetings in March (date to be announced)

Action Items/Decisions

Action Items/Decisions

- LN: Update working draft doc APPENDIX 1: BLOCK DIAGRAM FOR COMPONENTS AND INTERCONNECT proposed diagram(s) from ES for TF review
- LN: Send SEMIconnect invite to TF
- LN: Schedule next TF meeting
- MP: to review ES comments and try to close as many as possible independently with ES.

Discussion Notes





















Discussion Notes

- Cycle 2 Ballot 1-Feb-2022 submission, voting on 15-Feb-2022, closes on 17-Mar-2022
 - Spring meetings in March

Next Meeting(s) and Adjournment

Next BIM TF Full Team Meeting(s)

12-Jan-2022 2PM US Pacific

 Oklahoma City, OK, USA CST (UTC -6)	Wed, Jan 12, 2022	4:00 pm	
 Phoenix, AZ, USA MST (UTC -7)	Wed, Jan 12, 2022	3:00 pm	
 Albany, NY, USA EST (UTC -5)	Wed, Jan 12, 2022	5:00 pm	
 Dublin, Ireland GMT (UTC +0)	Wed, Jan 12, 2022	10:00 pm	
 Israel Daylight Time, IDT* IDT (UTC +3)	Thu, Jan 13, 2022	1:00 am	
 Hyderabad, India IST (UTC +5:30)	Thu, Jan 13, 2022 Holiday: Lohri	3:30 am	
 San Francisco, CA, USA PST (UTC -8)	Wed, Jan 12, 2022	2:00 pm	
 Tokyo, Japan JST (UTC +9)	Thu, Jan 13, 2022	7:00 am	
 Paris, France CET (UTC +1)	Wed, Jan 12, 2022	11:00 pm	
 London, United Kingdom GMT (UTC +0)	Wed, Jan 12, 2022	10:00 pm	

Support Information