AMHS TOTAL SOLUTION PROVIDER IN SEMICONDUCTOR MANUFACTURING

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COMPANY PROFILE

MFSG is a Singapore-based provider of Automated Material Handling Systems (AMHS) to major semiconductor manufacturers. We are a subsidiary of MeetFuture Group which is headquartered in Shanghai, China. **With over 20 years of expertise,** we have been dedicated to being a dependable AMHS provider for our clients. We are committed to improving production efficiency and product yield by providing the most comprehensive AMHS solutions, which include customizable hardware and software solutions, by leveraging AI algorithm technology. At MFSG, we strive to provide efficient, precise and safe semiconductor intelligent manufacturing automation solutions for global semiconductor frontend wafer fab, advanced packaging fab and backend testing and assembly fab.

MeetFuture Group boast an in-house Research and Development team based in Shanghai, dedicated to delivering tailor-made solutions to meet the unique requirements of our end customers. This strategic placement of our R&D division enables us to offer bespoke solutions that precisely address the evolving needs of our clients. With a focus on innovation and collaboration, our R&D team works closely with clients to ensure that our solutions not only meet but exceed their expectation, fostering long-term partnerships built on trust and mutual success.

Our production facilities are strategically situated in the Lingang New Area of Shanghai, China and the Kulim Hi-Tech Park, Malaysia (scheduled to open in Q3 2024). This dual location setup is meticulously designed to enhance the agility and resilience of our global supply chain. By having facilities in both China and Malaysia, we can efficiently cater the diverse needs of our clients while minimizing any potential disruptions in the global support system. This strategic approach not only ensures flexibility but also serves as a proactive measure to mitigate risks associated with logistical challenges, regulatory changes and other unforeseen circumstances. Such a comprehensive setup reaffirms our commitment to delivering consistent and reliable solutions to our valued customers worldwide, reinforcing our position as a trusted partner in semiconductor manufacturing industry.

MFSG MEET FUTURE

Our Vision

To become a globally influential semiconductor equipment company.

Our Mission

Leading the future of smart factories, continuously creating customer value.

Our Values

Open-mindedness

Remain receptive to fresh ideas and approaches for enhancement

Innovative Spirit

Embrace unconventional thinking to foster continuous innovation and the development of cutting-edge technologies for the future

Practical Quality

Commitment to delivering high standard and reliability in a manner that is realistic, functional and applicable to real-world situations

Advancement Mindset

With determination and a proactive mindset, we can enhance the value we bring to our journey toward excellence.

MFSG Pte. Ltd. is ISO certified since 27-Mar-2023

ISO 9001:2015 certification demonstrates MFSG's commitment to quality, customer satisfaction, and continual improvement. By adhering to the standard's requirements, we can provide customers with consistent, high quality products or services, effective communication, and a focus on customer satisfaction.

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AUTOMATED MATERIAL HANDLING SYSTEM

Front-end wafer manufacturing

- 200mm HA200 / SMIF Pod
- 300mm FOUP / FOSB
- RSP150 – Reticle SMIF Pod

Advanced Packaging

- 300mm FOUP / FOSB
- Wafer Magazine
- Tray Cassette
- Metal Cassette / Frame

Back-end Assembly & Test

- Magazine
- Metal Cassette
- Tray Cassette

AUTOMATED MATERIAL HANDLING SYSTEM (AMHS) TOTAL SOLUTION

Discover MFSG's extensive range of Automated Material Handling System (AMHS) solutions, boasting over 30 independently developed hardware devices, a sophisticated Material Control System (MCS) and cutting-edge control system for diverse material handling equipment.

With a comprehensive product line, we offer a one-stop solution for all your AMHS needs. Our products have been deployed in more than 30 prestigious wafer fabs, attesting to their reliability and performance. In 2023 alone, we successfully delivered total solutions tailored for both 8-inch and 12-inch wafer fab, showcasing our commitment to innovation and excellence in semiconductor manufacturing automation.

Trust MFSG to elevate your manufacturing process with our proven AMHS solutions.

Storage Equipment

FOUP/SMIF Pod Stocker
Tower Stocker
Reticle Pod Stocker
Over Head Buffer (OHB)
Near Tool Buffer (NTB)
Reticle Cabinet (RC)
E-Rack
Operator Load Unload Station (OLUS)
Alternative Loadport (ALP)

Purging Equipment

Tool Loadport Purge (TLP)
Overhead Purge System (OPS)
Front Purge System (FPS)

AMHS Software

Material Control System (MCS)
AMHS Monitoring System (AMS)
OHT Controller (OHTC)
Mobile Robot Controller (MRC)
Fab Monitoring & Simulation (FMS)

Transport Equipment

Overhead Hoist Transport (OHT)
Autonomous Mobile Robot (AMR)
Conveyor

Identification Equipment

Smart Tag Reader
RFID Reader
E84 Sensor

TRANSPORT EQUIPMENT

Overhead Hoist Transport (OHT)

OHTs are essentially robotic vehicles that move overhead along a track system within a FAB. They are designed to transport materials, such as wafers, reticles or substrates, between different processing tools and stations. This automation reduces the need for manual handling, improving efficiency, precision, and safety in the manufacturing process.

Autonomous Mobile Robot (AMR)

AMRs are robots that can navigate and move around in an environment without requiring any human guidance or control. AMRs use various sensors, cameras, and mapping technologies to detect obstacles, plan their routes, and safely navigate from one point to another autonomously, reducing the risk of accidents in busy workplaces.

Cleanroom Conveyor

Its primary function is as a transportation mechanism for varying ceiling heights, facilitating the movement of FOUP/POD between Process equipment, stockers (STK), and tower stockers. By strategically linking different devices in a series based on the process flow, a designated number of carriers can be temporarily stored.

STORAGE EQUIPMENT

Wafer Carrier Stocker

This system is utilized for conveying and storing wafer carriers between production processes in the semiconductor cleanroom. It supports a wide range of carriers such as FOUP/Pod/Reticle Pod/Cassettes/Magazines/etc and includes the N2/xCDA purge function.

Reticle Pod Stocker

This is a storage system designed for storing reticle pods in the FAB, providing a controlled cleanroom environment for these pods. It seamlessly integrates with OHTs, conveyors, or AMRs for efficient transportation within the semiconductor manufacturing facility.

Tower Stocker

This system is utilized for cross-floor storage and transportation of materials within the cleanroom of a semiconductor fab. It has the ability to transfer Pods/FOUPs at speeds of up to 3.5m/s, ensuring efficient loading and unloading operations while adhering to clean transportation standards.

STORAGE EQUIPMENT

Near Tool Buffer (NTB)

This device serves as a buffer between the load ports of the OHT and the tool, aiming to decrease the tool's idle time and increase its utilization rate. It is designed in accordance with SEMI E15.1 standards and can seamlessly connect to the load port.

Operator Load Unload Station (OLUS)

This system serves as a link between manual loading and OHT transfers. It allows operators or AMRs to load FOUPs/Pods onto OLUS, which OHTs can then pick up and transfer to alternate storage, and vice versa. With its compact footprint, it can be easily deployed throughout the fab wherever OHT access is available.

E-Rack

eRacks are designed to maximize space utilization, ensure easy access to stored items, and often integrate with AMRs for fully automated transportation. They come equipped with an RFID system, facilitating instant traceability of materials throughout the entire production cycle.

XCDA/N_2 PURGE EQUIPMENT

Tool Loadport Purge (TLP)

TLP is typically installed in critical tools utilizing wafer processes to enhance quality control in the manufacturing process. It achieves this by purging high-flow N2/XCDA gas into the carrier. The outcome is an improved yield.MFSG's TLP can rapidly reduce the microenvironment humidity of the FOUP to below RH 1%. It offers the advantage of easy retrofitting with existing tool loadports.

Overhead Purge System (OPS)

For critical processes, it is possible to install OHB with purge unit to ensure undesired chemical reactions in carrier due to humidity and evaporation. OPS can also be easily retrofitted with existing systems without having to change the fab structure. Every purge nest is individually monitored and controlled with constant gas flow during the entire storage period.

Reticle Cabinet (Purge)

Purge Reticle Cabinet is a piece of small-footprint equipment that can be installed nearby Lithography tools. To preserve the quality of the reticle, it is utilized to hold reticle pods that have been purge-filled with XCDA gas. Within a short period of time (<30mins), humidity may be effectively managed to be below RH 10%.

AMHS IDENTIFICATION EQUIPMENT

Smart Tag Reader

An electronic reader, which is the core part of AMHS equipment. It can read the information of the smart tag through the infrared signal and send it to the AMHS system. The success rate is up to 99%.

RFID Reader

An RFID reader is a device used to read and collect data from RFID tags. RFID, or Radio Frequency Identification, is a technology that employs electromagnetic fields to automatically identify and track tags attached to objects. MFSG offers various models of RFID readers spanning from low to ultra-high frequencies, tailored to specific needs.

E84 Sensor

The E84 Sensor device is an optical communication sensor based on an invisible infrared light transmission link. It is used for SEMI-E84 protocol communication in semiconductor industry-related manufacturing equipment, transmitting 8-bit input/output signals.

AMHS SOFTWARE

MFSG offers comprehensive software for control, tracking, and visualization of the whole materials transportation process. By leveraging the AI algorithm technology in our system, the Material Control System (MCS) coordinates all required material movements from the initial stage of FAB set up to the mass production and includes continuous optimization.

FAB MONITORING SYSTEM (FMS)

It is a reporting and simulation software created for purpose of modernizing global FAB manufacturing operations. It is fully customized for automated FABs with ability to optimize the product mix variability, improve throughput, cycle time and equipment efficiency, as well as reduce inventory and costing. Portal can display real-time **Monitoring** of production WIP, equipment status, facility status, as well as actual AMHS delivery system in 3D format. Analysis of **Cross FAB WIP** can be built according to user's requirement.

CUSTOMER LAYER (MES/RTD/EAP)

MES is a software-based system that is used to manage and control the manufacturing process on the shop floor. It provides real-time monitoring of the manufacturing process, including equipment status, production progress, and quality control metrics. This allows operators and managers to have up-to-date visibility into the production line.

CORE LAYER - MATERIAL CONTROL SYSTEM (MCS)

This system is tasked with processing commands from the Manufacturing Execution System (MES), optimizing path management for efficiency, and developing automated solutions to address AMHS anomalies. It is dedicated to overseeing material control in a semiconductor FAB, monitoring the flow of wafer and reticle carriers. This ensures accurate inventory management and traceability.

Connecting with various AMHS System	**Material handling route optimization**	**In-fab & cross-fab handling management**
Inventory Management	**Void storage management**	**Storage area division management**

HARDWARE LAYER

It is a system for scheduling and managing various materials handling equipment. By controlling and scheduling the materials handling in real time through data acquisition, it ensure the optimum handling route. The equipment control system is connected with the host's MCS system to form the overall AMHS software control system.

Transport	Storage	Purge
Overhead Hoist Transport Controller (OHTC)	FOUP Stocker Control System	Loadport Purge Management System
Mobile Robot Controller (MRC)	Reticle Stocker Control System	Autoloader Purging Control System
Robot Management System (RMS)	NTB Control System	Overhead Buffer Purging Control System
Lifter Control System	OHB Control System	
Conveyor Control System		

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ADVANTAGES OF MFSG AMHS SOLUTION

AMHS TOTAL SOLUTION FOR SEMICONDUCTOR INDUSTRY

We offer end-to-end AMHS total solutions for all semiconductor customers, encompassing Frontend, Advanced Packaging and Backend Testing and Assembly. We strive to provide comprehensive AMHS solutions in line with the Smart Factory concept.

INDEPENDENTLY RESEARCH AND DEVELOPMENT PRODUCTS

We conduct independent research and development of our AMHS products, processing key technologies that are integral to product design, research and manufacturing process.

INTEGRATED PLANNING OF AMHS IN SEMICONDUCTOR FACTORIES

With a wealth of experience collaborating with top-tier semiconductor firms internationally, we have effectively executed AMHS layouts for numerous prominent fabs across Southeast Asia. Our proficiency extends to offering AMHS planning proposals during the initial fab planning stages, guaranteeing optimal layouts for AMHS, EQ and Facility planning. Our aim is to maximize production capacity while upholding stringent standards for safety and efficiency.

COMPETITIVE IN TECHNICAL QUALITY AND LEAD TIME

We operate production bases in both Lingang, China, and Penang, Malaysia, strategically enhancing our global supply chain capabilities. This geographical diversity empowers us to optimize lead times for our products, ensuring competitive advantage in meeting customer demands across different regions. By leveraging our presence in key manufacturing hubs, we deliver superior responsiveness and efficiency, driving value for our customers worldwide.

EXPERIENCED AND EFFICIENT IMPLEMENTATION TEAM

Our implementation team comprises core members with extensive experience from leading integrated circuit fabs both domestically and internationally, as well as renowned foreign semiconductor AMHS equipment companies. All our project managers have more than 10 years of work experience in the field of AMHS, ensuring the highest level of proficiency and effectiveness in project execution.

PROFESSIONAL AND EFFICIENT SERVICE TEAM

Our aftersales service is customer-centric, driven by our expert staff holding relevant work experiences and qualifications. We customize our support to align with customer needs, providing a minimum of one year of on-site service. Our focus is on swift responsiveness, ensuring prompt attention to any customer requirements.

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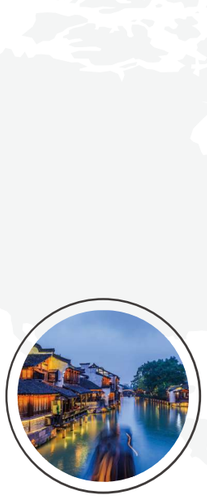
GLOBAL BUSINESS MAP

At MeetFuture Group, we are dedicated to emerging as a leading global provider of AMHS equipment and core components for semiconductor industry.

Beijing Subsidiary



Suzhou Service Centre

Shaoxing Subsidiary

Hefei Service Centre

Wuhan Service Centre

Headquarters
Shanghai Lingang

Manufacturing
Shanghai Lingang

Shanghai Service Centre

MFMY Sdn Bhd
Malaysia subsidiary :
Global Manufacturing and Service Center

MFSG Pte Ltd
Singapore Subsidiary :
Global Sales Hub

- Headquarters & Manufacture
- China Subsidiary
- China Service Office
- Singapore Subsidiary
- Malaysia Subsidiary

COMPANY MILESTONES

2015-2017

◎ Established MeetFuture
◎ Technical services cover China's Top-10 LED factories

2018

◎ MFSG established in Singapore

◎ MeetFuture started AMHS business

2019

◎ Delivered Front Loadport Purge (FLP) to 12" Wafer Foundry in Singapore

◎ Delivered first batch of AGV to the largest LED company in China
◎ First batch of AMR passed validation in 12" Wafer Fab
◎ Delivered first batch of Stocker and Purging system to 12" Wafer Fab
◎ Delivered first batch of 12" Wafer Fab APC systems

2020

◎ Singapore Business Federation Member
◎ Co-developed OHT System
◎ Co-developed Reticle Stocker

◎ Delivered Stocker to 12" Bare Silicon Wafer Fab
◎ Delivered Near Tool Buffer (NTB) to 12" Wafer Fab
◎ Established MeetFuture Sirius AI Algorithm Laboratory

2021

◎ Successfully completed Series A financing round.
◎ 2000㎡ Lingang factory officially started production
◎ Delivered Reticle Stocker to 12" Wafer Fab
◎ Received PO for OHT from 8" and 12" Wafer Fabs
◎ Domestic AMHS product deliveries exceed US$130m

2022

◎ Registered as SEMI Association Member
◎ Singapore Semiconductor Industry Association (SSIA) Member
◎ Participated in SEMICON SEA
◎ Participated in SEMICON Europa

◎ AMHS localization project worth US$98m signed with Shanghai "East Chip Port"
◎ Completed Series B financing round with over US$50m in March
◎ Awarded as a specialized and innovative enterprise in Shanghai
◎ Received 2 POs for complete 12" new wafer fab AMHS solution and 1 PO for 8" fab; successfully delivered in 2023

2023

◎ MFSG Demo line in Singapore

◎ MeetFuture undertakes the key project of Shanghai's' Standardization Pilot for Semiconductor Wafer Front-end AMHS Manufacturing'
◎ 8000㎡ new Lingang factory officially start production in Q4 2023
◎ Participated in SEMICON China and successfully domestic AMHS technology seminar
◎ Completed acceptance of the first domestically produced Full-Fab AMHS solution

2024

◎ MFMY established in Malaysia and new factory will be opened in Q3

◎ MeetFuture obtained certification of "Enterprise Innovation Centre"
◎ Obtained dual certifications as"Pudong New Area Enterprise R&D Institution" and "Lingang New Area Enterprise R&D Innovation Institution"