

Product Quality

Enhance Quality Culture

Promote continuous improvement programs to enhance the internal quality culture



Encourage local suppliers to participate in Taiwan Continuous Improvement Awards (TCIA) to strengthen quality culture and competitiveness within local supply chain

Improve Quality Capability

Develop innovative testing methods to enhance product, technology and production quality



2030 Goals

- Generate up to NT\$20 billion in value from improvement projects and involve outstanding projects in Taiwan Continuous Improvement Awards (TCIA)
- Encourage major local raw materials suppliers^{Note 1} to participate in TCIA, with 60% advancing to finals; among them, wafer manufacturing raw materials suppliers have a 100% participation rate, and advanced packaging raw materials suppliers have 75%

2024 Targets

- Generate NT\$15 billion in value from improvement projects and involve at least six outstanding projects in TCIA
- Encourage major local raw materials suppliers to participate in TCIA, with 20% advancing to finals; among them, wafer manufacturing raw materials suppliers have a 100% participation rate, and advanced packaging raw materials suppliers have 60%

2023 Achievements

- Generated more than NT\$14 billion in value from improvement projects
Target: NT\$14 billion
- Involved 9 outstanding projects in TCIA
Target: 6 projects
- 14% of major local raw materials suppliers advanced to the finals of TCIA^{Note 2}
Target: 20%
- 74% of wafer manufacturing raw materials suppliers participated in TCIA^{Note 2}
Target: 100%
- 60% of advanced packaging raw materials suppliers participated in TCIA
Target: 60%

- Develop a cumulative total of 3,000 innovative testing methods for quality and reliability^{Note 3}

Develop 290 innovative testing methods for quality and reliability

- Developed 283 innovative testing methods for quality and reliability
Target: 278

Applicable to all TSMC fabs around the world Applicable to TSMC fabs in Taiwan and other specific fabs Only applicable to TSMC fabs in Taiwan Exceeded Achieved Missed target

Note 1: Major local raw materials suppliers are those that meet at least one of the following conditions: 1. accounted for 85% of purchasing expenses; 2. single-source supplier; 3. ongoing trading orders are placed each quarter and applied to critical processes; major raw materials suppliers and back-end packaging materials suppliers were renamed wafer manufacturing raw material suppliers and advanced packaging raw material suppliers

Note 2: As suppliers invested in production capacity restoration in the post-pandemic era, their participation resources and intention were affected; TSMC will continue to provide consultations to suppliers to improve their participation intention and quality of proposal

Note 3: Starting from 2021

Product Quality

Enhance Sustainable Chemicals Management

Develop hazardous substance analysis capabilities in chemical laboratories to ensure occupational health and safety (OHS)



Strengthen management for hazardous substances to improve green manufacturing

Realize Quality Application

Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies in the design and development stage based on the Company's technology roadmap to ensure quality and safety without any concerns



2030 Goals

Develop the ability to analyze 100% of carcinogenic, mutagenic, and reprotoxic (CMR) substances and help suppliers supplying materials with potential risks develop the same capabilities^{Note 4}

Replace 100% of N-methylpyrrolidone (NMP) (Base year: 2016)

No processes involving perfluoroalkyl substances (PFASs) that have more than four perfluorinated carbons

Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies in the design and development stage based on the Company's technology roadmap

Zero cases of product recall by customers due to safety concerns **NEW**

2024 Targets

Develop the ability to identify and analyze 100% of CMR substances and helped 100% of suppliers supplying materials with potential risks to develop the same capabilities

Replace 100% of NMP used for etching processes in the overseas fabs TSMC (China), TSMC (Nanjing), and TSMC Washington, LLC

Replace 100% of photoresists containing PFHxA (Perfluorohexanoic Acid) related substances in VisEra

Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies per the R&D targets

Zero cases of product recall by customers due to safety concerns

2023 Achievements

Developed the ability to identify and analyze 100% of CMR substances and helped 100% of suppliers supplying materials with potential risks to develop the same capabilities
Target: 100%

71% replacement completed in the etching process in overseas subsidiaries' fabs
^{Note 5} Target: 100%

Replace 14% of photoresists containing PFHxA related substances in VisEra
^{Note 6} Target: 36%

Completed quality and reliability certification for enhanced N3E process technology, 22nm embedded MRAM IP, TSMC-SoIC[®] stacking technology

Zero cases of product recall by customers due to safety concerns **NEW**

Applicable to all TSMC fabs around the world Applicable to TSMC fabs in Taiwan and other specific fabs Only applicable to TSMC fabs in Taiwan Exceeded Achieved Missed target

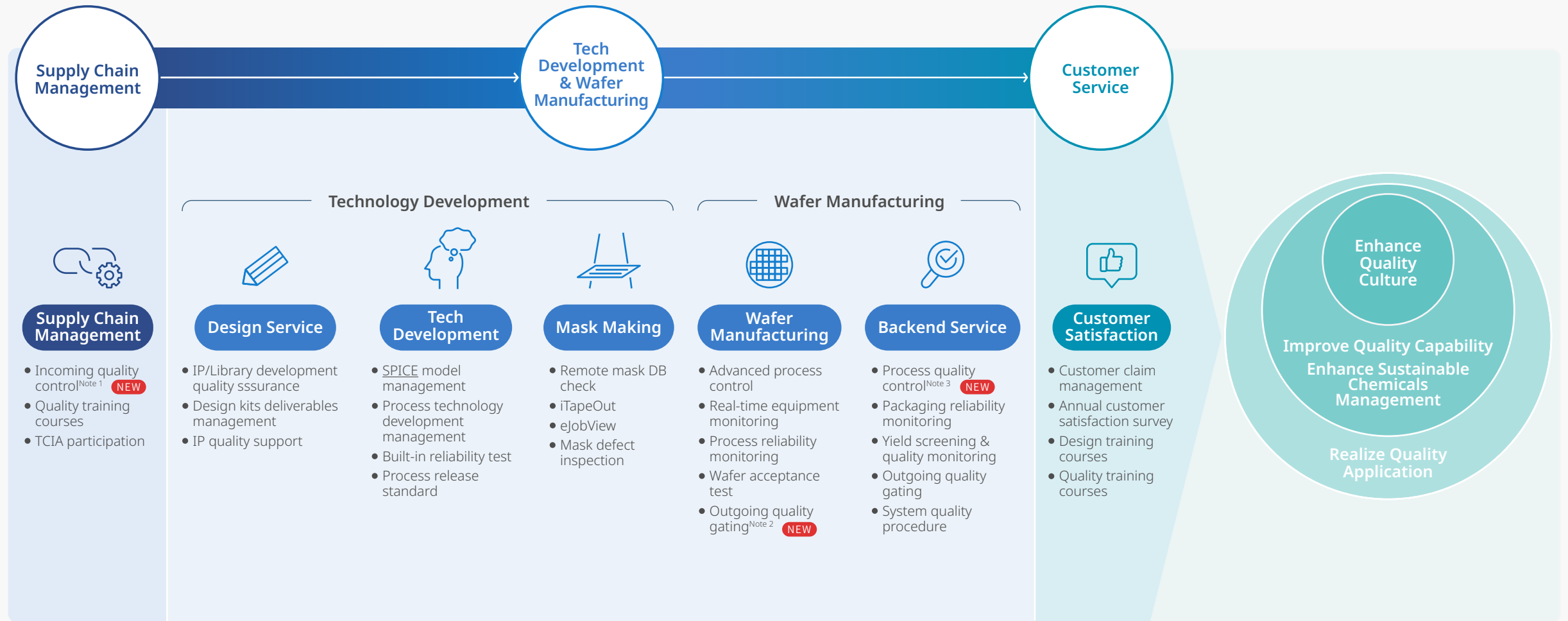
Note 4: In response to developments in process technologies, all materials with potential risks supplied by new suppliers must pass CMR testing

Note 5: In 2023, the NMP replacement progress was affected due to the poor capacity utilization and the delay in the supply of suppliers; a full replacement is expected to be completed in 2024

Note 6: Because one customer of VisEra requires additional verification for alternative photoresists, the completion time for 100% substitution will be extended to 2025

TSMC spotlights the quality standards of all operational aspects and advanced technology development, wafer manufacturing, customer service, and supply chain management. In 2023, it further introduced the Mandala Chart to include the spirit of continuous improvement in daily work and provide outstanding semiconductor manufacturing services. In 2023, TSMC's Quality and Reliability Laboratories introduced a total of 283 innovative testing methods to facilitate technology development. In addition, aligning with the global manufacturing strategy and arrangements, TSMC continued to adopt the Best Known Method (BKM) to support suppliers in improving the quality of raw materials and creating a resilient raw material supply chain to respond to geopolitical situations, shortage of supplies, and other challenges.

TSMC Quality Management System



Note 1: Optimize the chemical tank truck cleaning procedures to improve efficiency and reduce chemicals required for cleaning, ensure steady supply of raw materials, and assist in the smooth progress of domestic and overseas fab expansions

Note 2: Develop digital transformation tools that are used in the wafer shipping quality assurance operation and realize remote quality management by improving the skills of operating personnel through lecturing and practices

Note 3: Find the best process parameters through the design of experiments to solve the edge defect issue of SoIC chips and improve the yield

Enhance Quality Culture

TSMC is committed to promoting a quality culture of Constant Advances and Continuous Improvement. To actively root quality thinking in daily operations and lay a foundation for long-term success and sustainable development, TSMC introduced the Mandala Chart in 2023 to expand the initial six aspects to eight aspects: Define, Lead, Communicate, Encourage, Select, Integrate, Coach, and Drive. TSMC hosts company-wide training programs, competitions, and relevant promotional activities to drive cross-organizational learning and collaboration and enhance employees' problem-solving skills. Over 12,000 projects were submitted in 2023, generating more than NT\$14 billion in value.



Promotion Structure of Continuous Improvement Activities



2023 TQE-Winning Cases

Quality Improvement

Increase yield of image sensors
Yield increased by **26%**

- Develop a new process to improve the photoelectric conversion efficiency
- Optimize the film process to improve white pixel

Production Capacity Improvement

Improve the spike-annealing process
Improved the utilization by **83%**

- Optimize the gas flow ratio of the process
- Perform a detailed disassembly analysis to shorten the transmission and production time

Cost and Production Support

Automation of the human-machine cooperation fab
Task assignment precision increased by **20%**

- Customize the automated production scheduling to reduce the waste of crucial production capacity

Process and Efficiency Improvement

Optimize tank truck cleaning procedures
Reduced the number of days for tank truck cleaning by over **>65%**

- Establish standardized truck cleaning procedures that vertically apply to suppliers and horizontally apply to all materials

STOP & FIX

Improve the liquid leakage risk of green hydrogen units
Zero liquid leakage for over **1 year**

- Establish a temperature and pressure monitoring system
- Ultrasonic NDT for weld bead each year
- Improve the design of the electrolytic cell to solve the problem

ESH and Green Corporation

Self-reduction of ammonia gas
Reduced ammonia gas emissions by **63%**

- Adjust the source emission model
- Optimize the parameters of the processing equipment

Design of Experiment



Improve the quality of thin film deposition process

Improved the uniformity of film thickness by 45%

- Redesign the parts of the process tools and resolve the issue of poor efficiency in reactants mixing

Quality Audit



Audit method innovation

Carried out the comprehensive health check for the facility quality monitoring system

- Propose a scenario audit method to elaborate the storyline, and analyze the risk to identify suspicious points

NEW

Talent Cultivation



Optimize the new employee training system

New employee satisfaction reached 100%

- Replace old online courses with new
- Establish a Vocabulary Definition and Q&A Database
- Launch advanced physical courses

NEW

Rising Star



Intelligent Scheduling of Photolithography

Idle time of tools reduced by 32%

- Time-bucket based optimization model of mask scheduling
- Dynamic estimation of process time
- Strategically select the production route

Assistant Engineer and Module Associate Engineer



Improve the maintenance efficiency of equipment

Estimated annual benefit reaches NT\$26 million

- Introduce the auto-control module
- Design a dual-axis sliding track platform
- Utilize image modules and algorithm

Outstanding Proposals from Direct Labor



Improve the safety for work at height

Reduced the time of work at height by 100 hours per year

- Develop the emergency wheel with self-rotation functions to save energy for carts
- Produce trailer connecting rods to keep a safety distance between trailers



TSMC optimizes new employee training mechanisms through advanced physical courses

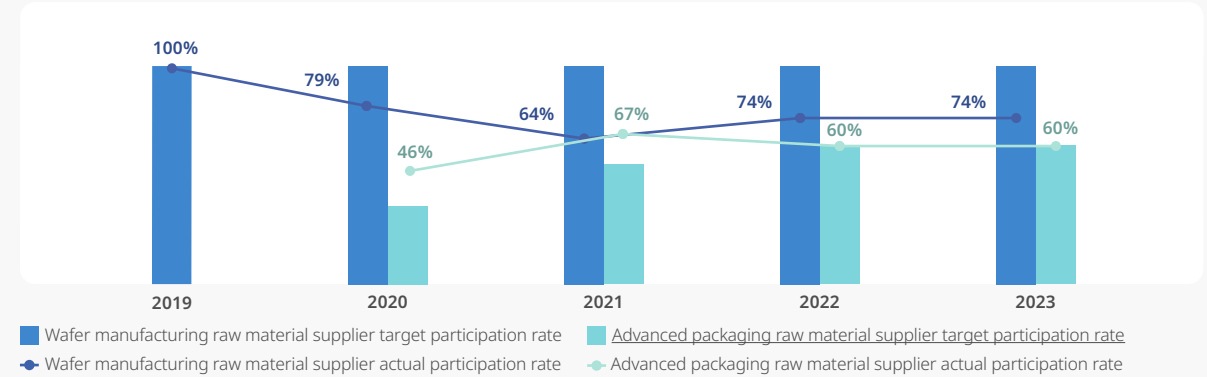
TSMC is committed to quality improvement. Apart from promoting internal continuous improvement activities, it is also a long-term participant of TCIA. By participating in the competition, TSMC exchanges practical knowledge on quality improvement with peers from other industries and accelerates the advancement of local industries. In 2023, TSMC received seven Gold Awards, two Silver Awards, and two Best Innovation Awards at TCIA, setting a record for TSMC. To strengthen the supply chain, TSMC also encourages major local raw materials suppliers to participate

in TCIA. As suppliers invested in production capacity restoration in the post-pandemic era, their participation resources and intentions were affected. However, TSMC still ensured that 74% of wafer manufacturing raw material major suppliers and 60% of advanced packaging raw materials suppliers were able to participate in the competition. A total of 14% of major local raw materials suppliers advanced to the finals and won one Gold Award, seven Silver Awards, and one Bronze Award. TSMC announced the list of winners on its [corporate website](#) to encourage suppliers to continue to improve.

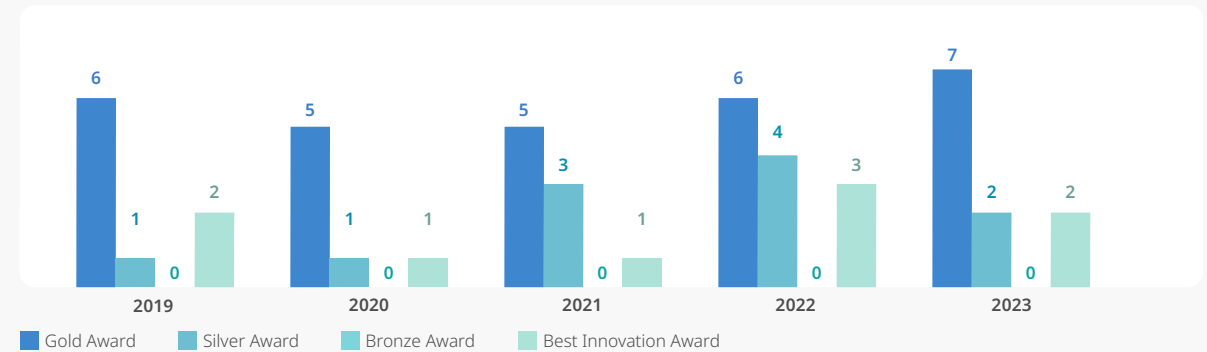
2023 TCIA-TSMC Winning Cases

Theme	Improvement benefit
<p>Improve EUV pellicle transmittance concurrently won the Best Innovation Award</p>	<p>12% EUV light penetration rate increased</p> <p>1.3 Billion (NT\$) Estimated improvement benefit reaches</p>
<p>Improve the yield for IoT chips</p>	<p>>70% Yield loss reduced</p> <p>70% Reduced the fluorine-containing GHG consumption</p>
<p>Improve the crucial process for automotive chips</p>	<p>70% Number of manual operations by personnel was reduced</p> <p>15% Monthly working hours of personnel were reduced</p>
<p>Optimize the production cycle of the advanced process</p>	<p>35% Production cycle improved by approximately</p> <p>143 Million (NT\$) Estimated improvement benefit reaches</p>
<p>Improve the efficiency of in-tool transmission for products</p>	<p>25% Reduced the time of in-tool transmission of products</p>
<p>Smart transformation of old fabs</p>	<p>6.2% Number of wafers produced by tools increased</p>
<p>New breakthrough in production capacity by smart fabs concurrently won the Best Innovation Award</p>	<p>2.6% Number of wafer output from tools in the 12-inch fab's <u>bottleneck units</u> per hour increased</p>

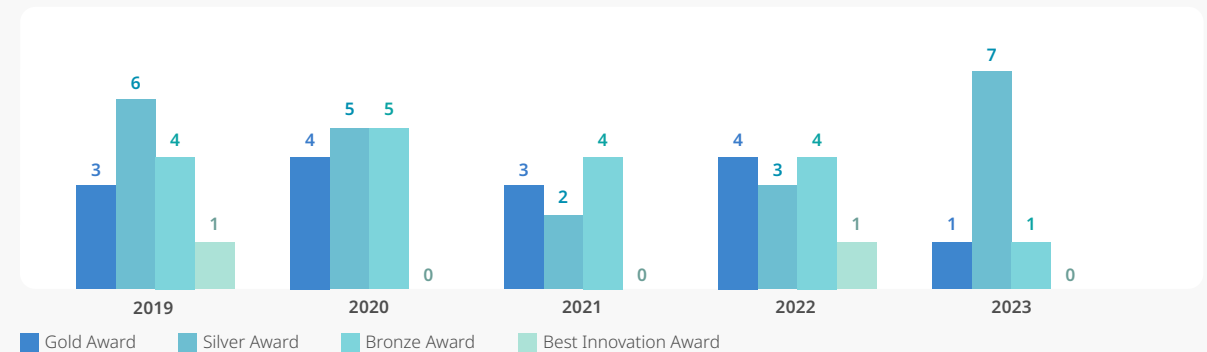
TSMC Supplier Track Record of Participating in TCIA



TSMC Track Record of Participating in TCIA



Percentage of Major Local Raw Materials Suppliers Participating in TCIA



Improve Quality Capability

Quality capability is crucial to technology leadership. TSMC is dedicated to perfecting R&D testing methods. In 2023, the laboratories introduced 283 innovative testing methods while ensuring that device characteristics, process yield, and product reliability comply with customer demands and standards to continue to minimize quality risks. [The high-performance and energy-saving Reliability Evaluation Method](#) optimized the parameters and conducted

the testing directly through the tool in the production line. Apart from saving energy by 99%, personnel may quickly fix problems and accelerate customer product innovation and time-to-market. In addition, in response to the global manufacturing strategies and arrangements, the demand for HF, a crucial material for the process, surged. TSMC collaborated with suppliers to [use waste from fertilizer manufacturing for HF production](#) to produce HF without affecting the quality of the process and create recycling values while expanding the production capacity of raw materials

and building a firm and environmental raw material supply chain.

To achieve sustainable operations, TSMC is dedicated to talent cultivation and local industry support. In 2023, it has exchanges with experts and scholars from Harvard University and Taiwan National Cheng Kung University to launch multi-year projects that carry out experiments, evaluation, and research focusing on machinery features and stress behaviors of semiconductor materials to accelerate the advanced packaging

technology R&D progress, stabilize the production line quality, and drive technological innovations. Meanwhile, to improve the competitiveness of the local supply chain, TSMC collaborated with SEMI (Semiconductor Equipment and Materials International) to organize the fifth Strategic Materials Conference in Taiwan, where domestic and foreign experts were invited to share the latest material technology. TSMC also participated in the Electronic Specialty Gas and System meeting in Arizona (US), to share the importance of technical targets and quality management with the local supply chain.

TSMC Quality and Reliability Laboratory Network



Sustainable Strategies from the Quality and Reliability Laboratories

<ul style="list-style-type: none"> Advanced Materials Analytic Center (AMAC) 	<ul style="list-style-type: none"> Develop the ability to identify and analyze 100% of CMR substances and improve source management in suppliers Evaluate and select technologies and materials for advanced processes Provide an analysis and technology exchange platform to strengthen suppliers' analytical capabilities
<ul style="list-style-type: none"> Chemistry Lab 	<ul style="list-style-type: none"> Accelerate the replacement of hazardous substances and help new TSMC facilities with designs for discharging Substances of Very High Concern (SVHCs) Verify the quality of materials recycled and reused at TSMC to ensure that they meet requirements for advanced processes and promote green manufacturing Verify the quality of alternative materials in response to TSMC's replacement of substances with high GWP NEW
<ul style="list-style-type: none"> Surface Analysis (SA) Lab 	<ul style="list-style-type: none"> Develop low-power consumption and high-capacity processes to increase the EUV energy efficiency Select eco-friendly materials and replace in processes Develop equipment consumables, reducing costs and extending consumable life by three times
<ul style="list-style-type: none"> Reliability Analysis (RA) Lab 	<ul style="list-style-type: none"> Complete reliability certification for the most advanced processes, specialty processes, and wafer-level packaging processes Develop efficient and energy-saving reliability evaluation method NEW
<ul style="list-style-type: none"> Advanced Failure Analysis (AFA) Lab Process Failure Analysis (PEFA) Lab Packaging & Assembly Failure Analysis (PAFA) Lab Product Failure Analysis (PFA) Lab Scanning Electron Microscope (SEM) Lab 	<ul style="list-style-type: none"> Accelerate advanced process development, yield improvement, and product DPPM reduction learning curve (reliability point of view) Apply for domestic and foreign patents through innovation and invention Donate tools to universities and provide training on how to operate and maintain equipment to cultivate tech talent
<ul style="list-style-type: none"> Transmission Electron Microscopy (TEM) Lab 	<ul style="list-style-type: none"> Continue to promote industry-academia cooperation programs Apply digital transformation and automatic data processing to increase efficiency

Enhance Sustainable Chemicals Management

To track the flow of materials with potential risks, TSMC's Advanced Materials Analytic Center (AMAC) has established mechanisms for screening CMR materials and expands the scope based on its technology roadmap to ensure the safety of employees and supply chain. In 2023, the AMAC screened 20 new semiconductor materials and developed the ability to identify and analyze all CMR substances. Meanwhile, TSMC has been actively establishing a safety protection network to introduce sustainable chemical management methods to subsidiaries, including helping VisEra strengthen protection for high-risk materials by sharing measures such as substitutes for high-risk chemicals, protection gear, and regular workplace assessments. TSMC also incorporated hazardous substance management regulations in the

TSMC Supplier Sustainability Standards and continued to provide training, auditing, and guidance to suppliers. In 2023, TSMC helped suppliers of materials with potential risks to develop capabilities to detect CMR substances.

In compliance with the TSMC Environmental Policy and TSMC Safety and Health Policy, TSMC is committed to implementing sustainable chemical management. TSMC has always aimed to avoid or minimize the use of hazardous substances. The related business unit is responsible to ensure that the storage, transport, use, and disposal of any irreplaceable hazardous materials are compliant with domestic and foreign regulations, as well as the ESH requirements of customers and TSMC. After the Corporate ESH Division and the Industrial Safety and Environmental Protection Departments have ensured the health and safety of all workers and the prevention of waste from polluting the environment,

such materials can only be used with consent from VP-level executives of related divisions or departments.

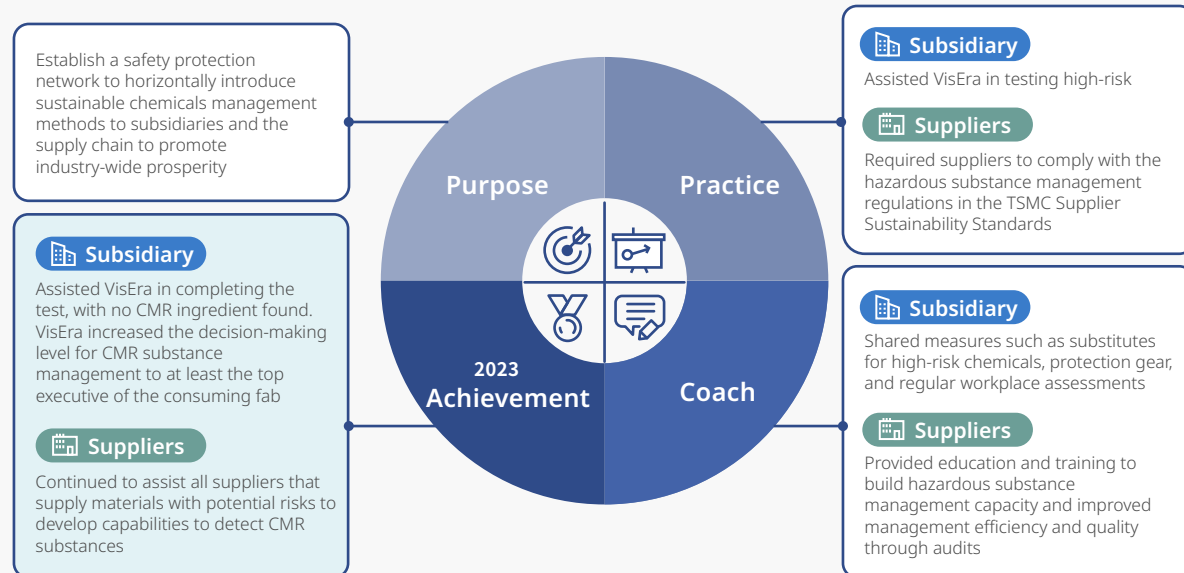
Regarding NMP commonly used in industrial and semiconductor processes, TSMC launched an industry-first replacement program in 2016. In 2022, TSMC was able to reduce NMP usage at all Taiwan facilities by 97.2%. The NMP replacement program was introduced to overseas locations; initially, TSMC estimated to achieve the 100% reduction target by the end of 2023; however, the testing progress for the replacement procedures was delayed due to poor production capacity and the postponed supply of suppliers. TSMC expects to replace all NMP use at overseas locations in 2024.

Also, Polyfluoroalkyl Substances (PFASs) are commonly used in industrial and consumer products because they are resistant to oil, water, and dirt. However, as PFASs are toxic, bio-cumulative, persistent, and have

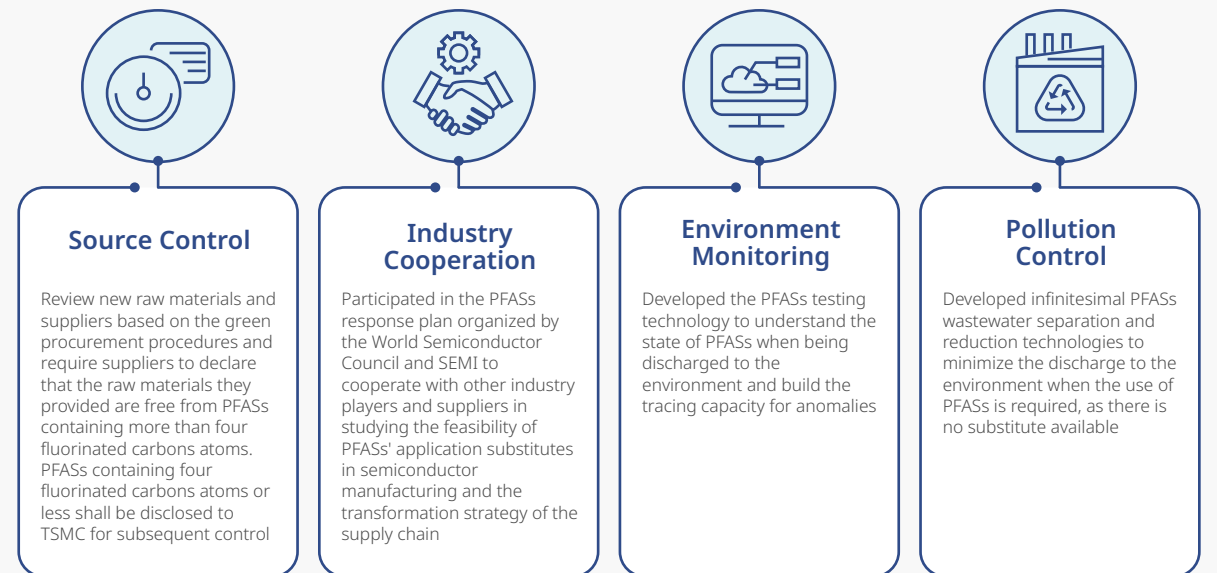
long moving distances that cause harm to the human body and environment, countries have promulgated laws for control. In response to the international trend, apart from replacing long-chain PFASs that have higher hazards, with short-chain PFASs or non-PFASs in accordance with past evaluations, TSMC also adopted source control, intra-industry cooperation, environment monitoring, pollution control and other countermeasures to mitigate environmental impacts.

To reinforce sustainable chemical management, TSMC obtained the certification of the QC 080000 Hazardous Substance Process Management System in 2006. The Company strives for improvements by utilizing the PDCA (plan, do, check, action) model for the compliance with regulations and the requirements of customers regarding hazardous substance control for process and products. All the TSMC fabs, upon official launch, acquire third-party certification.

CMR Substance Management Assistance Highlights



TSMC's PFASs Management Strategy



PDCA Cycle for Sustainable Chemicals Management

Identify and register in compliance with regulations and customer requirements

Each month, the Corporate ESH Division identifies regulations on hazardous substances management in Taiwan and beyond as well as customer requirements to inform related units to take the necessary measures and track progress through the internal electronic notification system

List of banned or restricted substances

Compile according to regulations, customer requirements, or TSMC requirements

Hazardous substance replacement programs

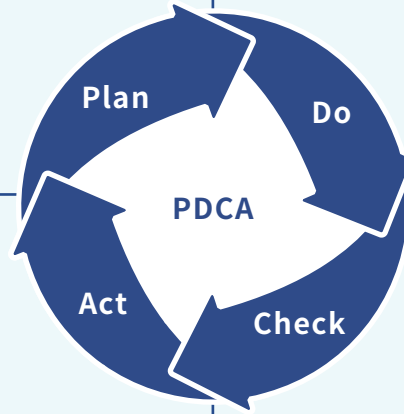
Formulate related plans in compliance with regulations, customer requirements, or TSMC requirements

- ✔ The EU added **11** SVHCs to REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) and customers have amended management measures for hazardous substances; TSMC complied with **all** new requirements
- ✔ Participated in the World Semiconductor Council and SEMI's PFASs initiatives to discuss countermeasures **NEW**

Management review

Each quarter, management from the Quality and Reliability Organization shall organize an interdepartmental meeting to review measures on hazardous substance management and progress toward annual targets

- ✔ Met the targets for suppliers audit and corrective actions tracking; follow-up new material inspection; and compliance with incoming material inspection



New material review

All new chemical materials or changes to existing materials are subject to review by the Corporate ESH Division and Industrial Safety and Environmental Protection Departments of the fabs to confirm the new chemical complies with ESH regulations before R&D evaluation

Implement hazardous substance replacement programs

Overseas subsidiaries continue to conduct NMP replacement program in wet etching processes; Subsidiary VisEra Technologies Ltd. continues PFHxA related materials replacement project

- ✔ Reviewed a total of **181** new chemicals, of which **118** were approved; of the **44** new chemicals that failed to pass reviews, **one** was rejected for containing substances highly hazardous to human health, **one** was rejected because the proper waste handling could not be guaranteed, and **42** were rejected because suppliers were unable to provide necessary information or there were no requirements for an assessment; additional **19** are still being reviewed
- ✔ Overseas subsidiaries continued to reduce the use of NMP in wet etching processes; now with **71%** completion
- ✔ Subsidiary VisEra Technologies Ltd. continues PFHxA related materials replacement project **NEW**

Raw material hazardous substance test

Suppliers are required to provide proof of compliance with hazardous substance specification test report issued by ISO17025 certified labs. TSMC may take random samples to ensure the compliance of raw materials

Product hazardous substance test

Sample and send main products to external ISO17025 certified labs for testing every year

Environmental Measurement

Developed ability to screen PFASs levels in water by referring to US EPA 537.1, enabling the regularly monitoring of effluents from various fabs

- ✔ Official launch of X-ray Fluorescence Spectrometer for detection of hazardous substances in raw materials to improve sampling efficiency
- ✔ Completed random sampling tests for **127** raw materials; all test results were in line with TSMC specifications
- ✔ Completed hazardous substance tests for main products; results showed compliance with relevant regulations and customers' and TSMC's specifications including **235** PFASs materials
- ✔ Regular monitoring water releasing in all fabs and more PFASs tests for suspicious raw materials **NEW**
- ✔ Developing PFASs test technologies, enabled for **30** PFASs detection **NEW**



Realize Quality Application

TSMC shows its commitment to quality in technology, manufacturing, and services. For quality in technology, TSMC helps customers design products with superior reliability. In 2023, TSMC completed quality and reliability certification for the enhanced N3E process, enhanced 22nm embedded MRAM IP, TSMC-SoIC® stacking technology, which stacks chip on wafer (CoW). For more details, please refer to [5.3.6 Quality and Reliability](#) of the TSMC 2023 Annual Report.

For quality in manufacturing, the Quality and Reliability (Q&R) Organization collaborates with operational organizations to establish and continuously improve real-time defense systems using advanced statistical methods and quality tools. The Quality and Reliability Organization and TSMC's fabs also work together on enhancements for automotive product quality improvement, including design rule implementation

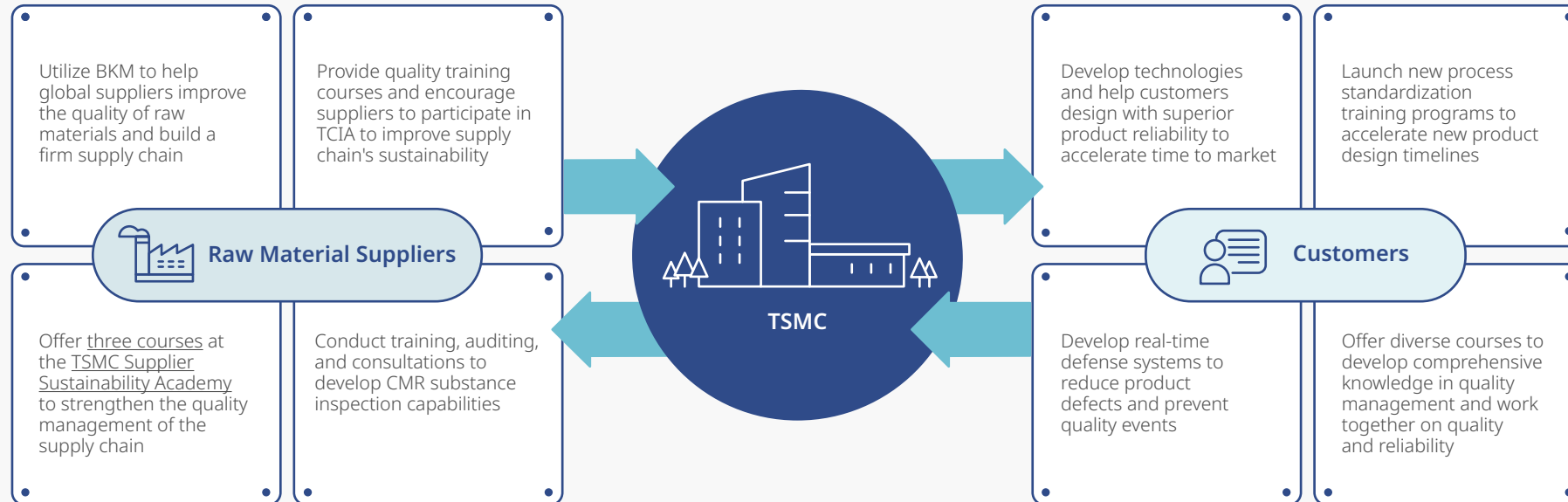
and migration to Automotive Quality System 2.0. This covers process capability requirements to tighten in-line and wafer acceptance testing in fabs and the handling of maverick wafers and lots. Q&R also provides dedicated resources for field/line return analysis and timely physical failure analysis (PFA) for process improvement to meet automotive customers' stringent defective parts per million (DPPM) requirements.

In terms of service quality, as advanced processes become more complex, TSMC provides standardized training courses on new process design flow to help customers become familiar with them. In 2023, TSMC assisted eight new customers and 700 individuals in completing training on the N3E process, accelerating product design schedules and successful chip tape-out. In addition, to reduce product defects and risks of product returns, TSMC offers diverse courses to customers, sharing technical knowledges on high-voltage stress, burn-in, and screening. In 2023, TSMC

shared quality-related information with 13 customers and worked closely on quality and reliability testing to ensure stable production lines and strengthen partnerships.

Thanks to qualification in technology development and innovative applications in semiconductor manufacturing services, as well as its continuous quality improvement culture introduced to suppliers and customers, TSMC had no product recalls initiated by customers due to safety concerns in 2023. Meanwhile, a third-party audit verified the effectiveness of TSMC's quality management systems in compliance with IATF 16949 and IECQ QC 080000 requirements. TSMC's advanced packaging testing fabs also continued to pass the certification of the American National Standards Institute ANSI/ESD (Electrostatic Discharge) S20.20 standard.

Development Focus of Quality Value Chain



TSMC develops efficient and energy-saving reliability evaluation method

Case Study

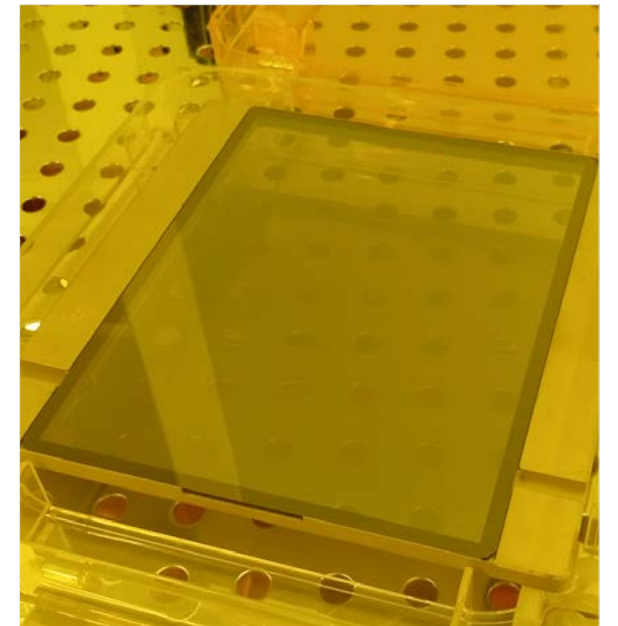
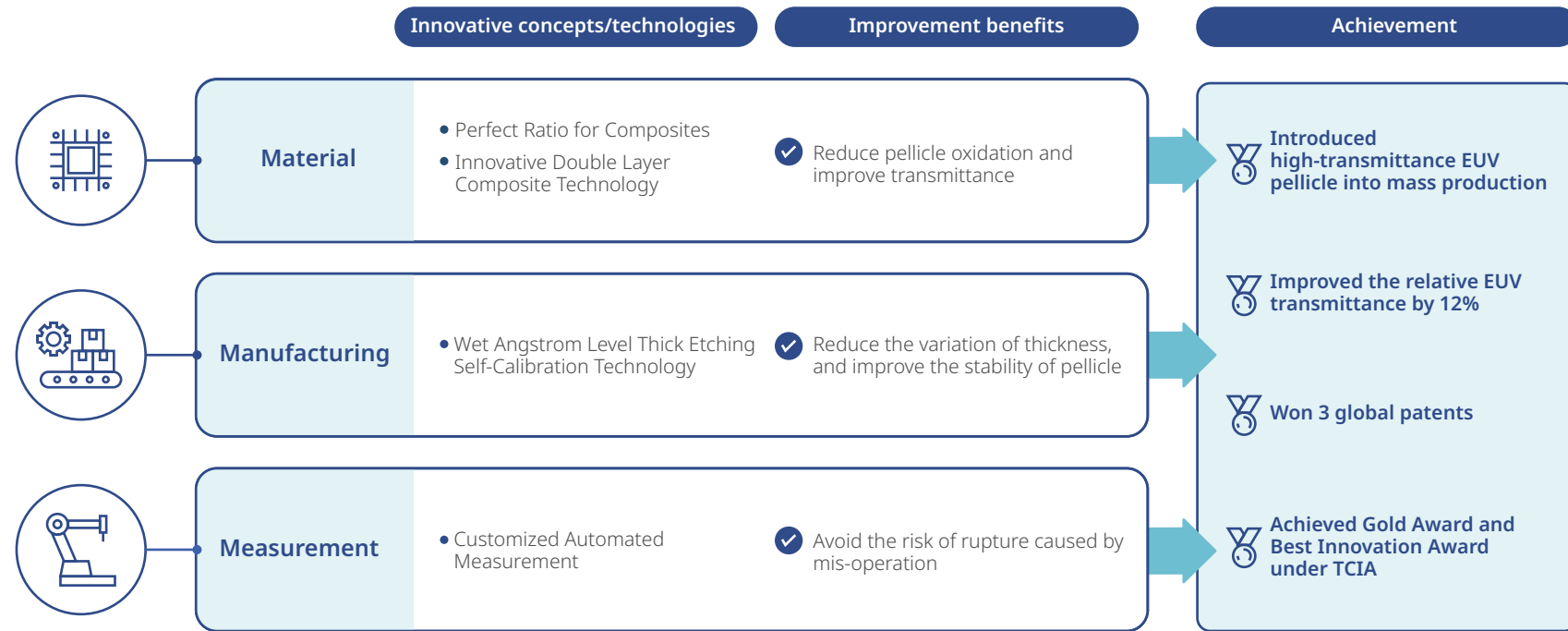
Development of High Transmittance EUV Pellicle Wins Three Patents

In response to the increasing demands for chips with 5nm node or below, EUV lithography has become an essential technology. In particular, reducing the EUV pellicle thickness and improving the transmittance can save the energy consumption of the EUV scanner and, in turn, improve the capacity. However, when the EUV pellicle becomes thinner, there may be thickness deviation, oxidation, and rupture risks. To ensure the technology leadership, in 2023, the Fab 3 Process Integration Department and EBO EUV Pellicle Project Department initiated a project to develop four major innovative concepts and technologies to break through the production bottleneck.

In terms of materials, TSMC added a layer of protection material by adopting the Perfect Ratio for Composites and the Innovative Double Layer Composite Technology to reduce the oxidation of pellicles and reduce the risk

of uneven transmittance caused by oxidation. For manufacturing, TSMC added an angstrom-level control system before solvent etching by adopting the Wet Angstrom Level Thick Etching Self-Calibration Technology to adjust the time required for etching on a rolling basis during the process based on the deviation of tools to realize automated calibration, reduce the variation of thickness, and improve the stability of pellicle. For quality control, TSMC successfully developed the Customized Automated Measurement to replace manual operation with automated systems, avoiding the risk of rupture caused by mis-operation and improving the measurement quality.

In 2023, TSMC successfully introduced high-transmittance EUV pellicle into mass production, and the relative EUV transmittance was improved by 12%; thus, TSMC won three international patents, as well as the Golden Award and the Best Innovation Award under TCIA, realizing quality and technical innovations.



TSMC develops high-transmittance EUV pellicle, realizing quality and technical innovations