

Higher productivity

Constantly pursue higher management efficiency

In corporate business activities, efforts to improve productivity will achieve greater efficiency in operations and will boost revenue. Tokyo Electron is reviewing and optimizing its current business processes across the company as a whole, in development and manufacturing divisions as well as in sales and management divisions, and we are promoting quality management throughout the value chain. We are aware of our corporate social responsibilities in the field of manufacturing, and therefore pursue greater productivity company-wide, with an awareness of high quality. In addition to in-house efforts, we also work with our business partners to continually improve the supply chain. Through these initiatives, we will endeavor to improve corporate value and contribute to the creation of a sustainable society.

Priority themes

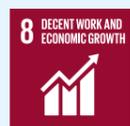


Quality management



Improvement of quality in the value chain

Relevant SDGs



Decent work and economic growth



Responsible consumption and production



Quality management

Quality policy

Tokyo Electron (TEL) has a quality policy shared by all group companies which it has developed and is rolling out.

1. **Quality Focus**
Focusing on quality to satisfy customers, meet production schedules, and reduce required maintenance even with temporary cost increases.
2. **Quality Design and Assurance**
Building quality into products and assure in-process quality control, from the design and development phase throughout every process.
3. **Quality and Trust**
When a quality-related problem occurs, working as a team to perform thorough root cause analysis and resolve problems as quickly as possible.
4. **Continual Improvement**
Ensuring customer satisfaction and trust by establishing quality goals and performance indicators and by implementing continual improvement using the PDCA cycle.
5. **Stakeholder Communication**
Listening to stakeholder expectations, providing timely product quality information, and making adjustments as needed.

In fiscal year 2018, we are displaying quality promotion posters at all our bases and have distributed quality commitment (code of conduct) cards to all employees in order to increase awareness of the policy.

Quality management throughout the value chain

TEL believes that continuous improvement, not only of products and services but also of all work processes, contributes to improved quality and productivity. We strive to improve operations throughout the value chain, while strengthening collaboration within the company and externally, reflecting the needs of customers.



Management system

TEL is building quality assurance systems under the leadership of the Representative Director, President & CEO. To provide consistent, high quality products, TEL has been acquiring ISO 9001 quality management system certification at various sites since 1994, and to date, nine of the group's manufacturing companies have successfully obtained certification.

ISO 9001 certified factories and offices

| Company name | Factory/Office name | Certification date |
|-------------------------------------|---------------------------------|--------------------|
| Tokyo Electron Technology Solutions | Yamanashi Office (Fujii/Hosaka) | September 1994 |
| | Tohoku Office | December 1994 |
| Tokyo Electron Kyushu | Koshi Office | March 1997 |
| TEL Magnetic Solutions | — | November 2009 |
| Tokyo Electron Korea | Balan Factory | September 2011 |
| Tokyo Electron Miyagi | Taiwa Office | September 2012 |
| TEL FSI | — | March 2013 |
| TEL Epion | — | May 2014 |
| TEL NEXX | — | |
| Tokyo Electron (Kunshan) | — | May 2018 |

Education

TEL believes that every employee needs to have a high awareness and understanding of quality and conducts various educational programs to this end.

In addition to the fundamental quality education that all new employees receive, we focus on PDCA education for all employees including those overseas. Through e-learning courses, employees learn the need for continuous improvement using the iterative four steps of the PDCA cycle. As of March 2018, 87% of our employees had completed the courses.

In addition, we promote an education program called TEL 6-Step, a problem-solving model for serious problems aimed at employees in production and service divisions. This is a customized version of the eight discipline (8D) problem-solving method¹ widely used in quality control. The TEL 6-step program enables systematic and reliable analysis of problems to determine the root cause, leading to quick implementation of countermeasures and prevention of similar problems. We currently use e-learning training for delivery, and as of March 2018, approximately 5,000 employees had completed the program. Since 2015, we have conducted not only online education but also group training aimed at overseas subsidiaries and development teams to provide opportunities for practical learning about resolution of quality issues.

Moreover, to enable employees to improve their knowledge and skills in the area of quality control, and to improve the quality of their work, we encourage them to obtain external QC certification² through the QM/QC Exam (Quality Management and Quality Control Examination). Since fiscal year 2012, the number of certified employees has increased each year to approximately 2,000 as of March 2018.



1 8D problem solving method: A method for solving problems in quality improvement through eight disciplines or processes
2 QC certification: Quality management certification operated by the Japanese Standards Association and the Union of Japanese Scientists and Engineers. The total number of people qualified nationwide exceeds 460,000 (as of February 2018).

Streamlining business operations

As one of the key issues in the medium-term management plan, TEL is working to improve productivity and efficiency in its operations. To do this, we are innovating and redesigning business processes across the entire company. By standardizing and optimizing the business processes of each division and site, we are endeavoring to build a structure where important information for management decisions and business operations can be acquired and utilized more quickly.

We have gathered experts from across our production, sales, logistics, service, accounting, and business management divisions around the world. Together, we are conducting a multifaceted review of our cross-functional, cross-division business processes, including customer processes such as ordering, production, shipping, and acceptance. By incorporating the results of this review into new core systems and other IT infrastructure, and by utilizing the vast amount of business-related information, we plan to realize highly productive operations.

Re-engineering of business processes



Improvement of quality in the value chain

Initiatives at the development and design stage

In order to improve the quality of products, it is important to avoid contamination by defects in upstream processes, and to ensure quality in each process so that defective products are not allowed to flow into later processes. From this perspective, Tokyo Electron (TEL) is promoting front-loading and self-process assurance systems. In order to raise the degree of product quality at an early stage, we implement thorough risk detection and mitigation measures (FMEA¹) from the initial stages of product design in an effort to suppress the occurrence or outflow of defects. We also conduct thorough inspections in each process and verification using simulation in the self-process assurance system. Furthermore, these measures are implemented continuously and effectively in order to prevent similar problems, including using TEL 6 Step to discover the root cause of defects which occur at customer sites or internally.

1 FMEA: Failure Mode and Effects Analysis. Method to grasp risks in advance, prevent and mitigate.

Response to safety laws and regulations

TEL regularly checks the safety regulations and guidelines concerning equipment, and has the established responding systems. Equipment is checked by a third party inspection company before shipment to ensure that the equipment complies with international safety standard and the guidelines like SEMI S2.² Also, regarding the Machinery Directive and EMC Directive,³ we obtain certificates of conformity from the Notified Bodies in Europe.

2 SEMI S2: This is a set of environmental, health, and safety guidelines for semiconductor manufacturing equipment

3 EMC Directive: This is one of the New Approach Directives that apply to the EU member states

Example initiative

At Tokyo Electron Kyushu, the Quality Assurance Division takes the initiative and implements their own method of quality control. They grouped their whole process in the factory by four phases (development, preparation for mass production, mass production and critical parts management) and make proposals with a different perspective from the developers by leveraging knowledge accumulated by the Quality Assurance Division. In these four phases, they identify quality risks with consideration of irregular work, equipment with new specifications and so on. They also conduct strict checks taking customer operations into consideration and propose measures that are effective for quality improvement and ensure thorough implementation of those measures. In this way, they aim to eradicate defects that occur after shipment of their products.

Executive message

In order to deliver high-quality products and services, as is the responsibility of a manufacturer, it is important for each and every employee to behave in a responsible manner with a high level of awareness in all business processes. We believe that continuous improvement of product and business process quality leads to meeting customers' expectations and achieving productivity (quality and efficiency) enhancements across all operations. By pursuing the world's best quality, we will build greater solid long-term trust with stakeholders and contribute to society through aiming for sustainable growth.



Streamlining software development

TEL is promoting greater efficiency by using its own common platform software across its diverse lineup of semiconductor production equipment.

By introducing common platform software that we have developed in-house, we are able to reduce the hours we spend on developing duplicate functions for each type of equipment. We have also achieved improvements in development efficiency when adding specific operations to individual pieces of equipment, by reducing the workload and amount of modification required. Design errors have also decreased in frequency, contributing to an improvement in software quality.

Furthermore, we are also working to share development know-how across multiple factories and offices. By periodically exchanging information on improvement efforts being undertaken by each department and the introduction of new development techniques, each department is achieving better activity outcomes. These activities have been ongoing for more than 10 years now, and play an important part in making our software development more efficient.

Initiatives with suppliers

Developing strong partnerships with suppliers is essential to improve product quality. Since 2000, TEL has regularly conducted Supplier Total Quality Assessments (STQA) to clarify what is expected of suppliers in terms of maintaining and improving quality.

Before starting business with new suppliers, an STQA is conducted via self-assessment to evaluate their product quality, costs, and information security. The assessment also includes CSR issues, including human rights, ethics, safety, and the environment. If any risks to quality are found, we visit the supplier on-site to explain the problems, our expectations for improvement, and the level of quality we require. After the supplier understands the issues, we ask that they plan and implement improvement measures. We also offer continual support to suppliers until all necessary improvements have been made. We conduct on-site audits once every three years at suppliers who manufacture important components and at suppliers where quality issues have been found.

We focus on the change control education with our suppliers. We aim to reduce the number of quality issues that occur as a result of changes to the design or manufacturing of equipment components and modules. We also aim to reduce the cost of quality improvements. We conduct briefings for suppliers to explain matters such as the importance of change control, and have conducted online training since fiscal year 2016.

Example initiative

Aside from the assessment program described above, Tokyo Electron Kyushu cooperates with suppliers to implement initiatives to reduce the occurrence of defective goods. We visit the production sites of suppliers to learn about their production environment whereby they are able to provide effective improvement proposals. We conduct process analysis together with suppliers to build better processes whereby we promote steady reduction of defects, creating win-win relationships for improved productivity.

Streamlining support

To provide customers with efficient support, TEL has introduced the TELeMetrics™ remote diagnostic service. This service connects us with installed equipment via the internet, enabling us to monitor the operating status of the equipment.

Previously when an equipment problem arose, field engineers would go onsite to the customer's plant, get the relevant equipment data, and bring it back for analysis and troubleshooting. With the introduction of the TELeMetrics™ service, we can now carry out checks at our office on the equipment screens for customers that share data with us, and we can download alarm logs and specify the cause of the problem. By having our specialist engineers analyze the data, we can quickly identify the cause. Narrowing down the parts and work necessary to address the issue with a high degree of reliability, also means we can reduce the time needed to resolve the problem.

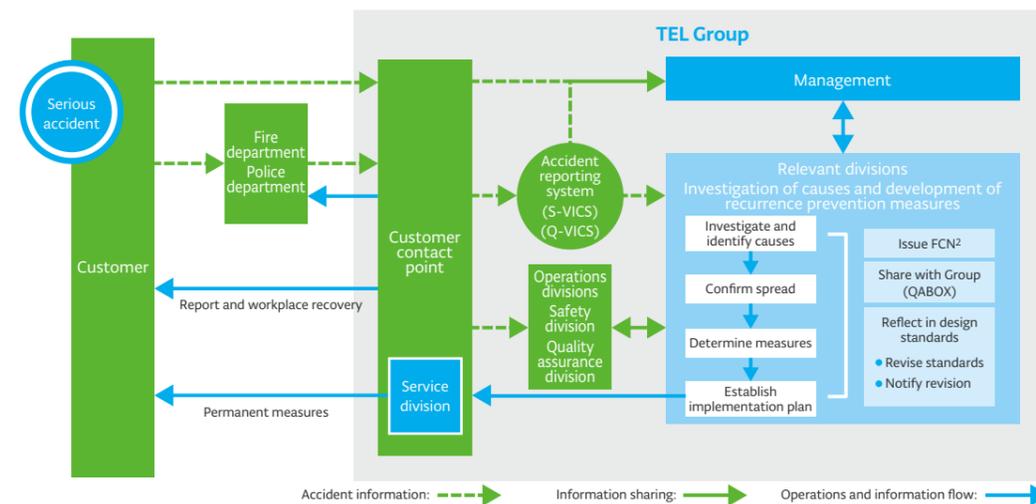
Response to quality problems

In addition to compliance with ISO and EN safety standards, TEL establishes design rules applicable to its own equipment to achieve the highest level of safety possible.

In addition to developing systems to manufacture safe products, we fulfill our mission as an equipment manufacturer by establishing systems for responding to design- or manufacturing-related issues or accidents arising from operation-related problems. If an accident occurs, we use our S-VICS accident reporting system to report and share information with all levels of management, from safety and quality personnel in each division all the way to senior management. We immediately conduct an accident investigation to identify the cause and plan preventive measures. In addition to implementing the measures on the problem equipment, we use a proprietary system called QABOX¹ to quickly implement the measures on equipment operated by other customers and reflect those measures in design standards in operation.

¹ QABOX: TEL Group internal information sharing and horizontal deployment tool

Response to serious workplace accidents



² FCN: Field Change Notice (general recall notice)