

TEL's Business

TEL is striving to obtain accurate estimates of and then reduce the environmental burden and safety hazards posed by its business activities.

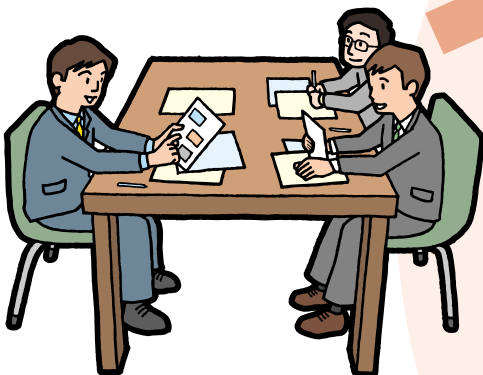
Reducing Environmental Burden and Safety Hazards in Each Stage

This page describes the full course of development of EXPEDIUS, one of TEL's core products which we will use as a typical example of an auto wet station. The figure below shows the process, from the first meeting to discuss specifications to the operation of the actual equipment as it produces semiconductors on our customer sites. The figure highlights approaches taken for reducing the environmental burden and safety hazards. Those must be considered essential factors throughout this process.

TEL
(Development and Manufacturing
of Semiconductor Production Equipment)

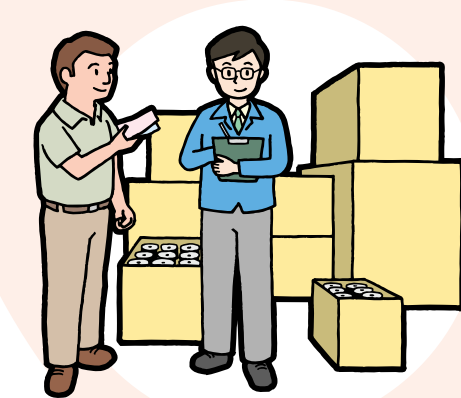
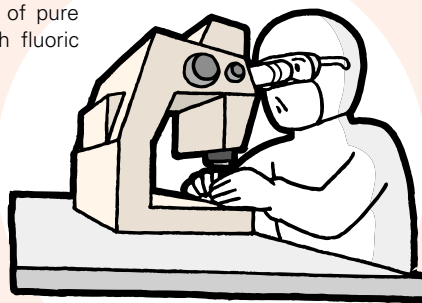
2 Process assessment

Following the customer's specifications, we test and observe the operation of the equipment while it is performing the semiconductor production processes the customer requires. We seek to reduce the amount of pure water used when EXPEDIUS cleans wafers with fluoric acid and alkaline chemicals (see p. 20).



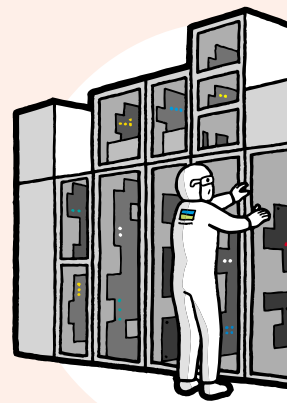
1 Specifications meeting

Requests from customers concerning semiconductor production equipment mention more than cost and delivery schedule – customers are also deeply concerned about throughput (for productivity) and yield (for quality). In addition, there are increasing environmental and safety requirements recently.



4 Procurement

Some parts of our equipment are standardized components, but most are special-order. TEL believes in practicing green procurement from suppliers of components used in the EXPEDIUS. This includes procuring components that contain no lead or other harmful substances (see p. 20 - 21).



* EXPEDIUS is developed and manufactured at the Saga plant of Tokyo Electron Kyushu Ltd.

The auto wet stations handled by our Surface Preparation Systems (SPS) BU clean wafers with pure water and a variety of chemicals. These remove particles and contaminations from the surface of the wafer while it is processed into semiconductors. The cutting-edge auto wet station EXPEDIUS reduces the amount of chemicals used and its high degree of product standardization allows shorter delivery and start-up times. It has been well received by our customers.

Masaaki Hata

General Manager
Surface Preparation Systems BU,
Tokyo Electron Limited



3 Design

We design our equipment according to the specifications given by the customer and the country in which the equipment is to be used. The effort we make in this stage to accommodate environmental and safety concerns pays off later in lower burden imposed by the equipment. EXPEDIUS offers a much smaller "footprint" than its previous models, saving space in the customer's facility. Future goals are to continue reducing the amount of lead in the equipment and to further standardize the specifications (see p. 20).

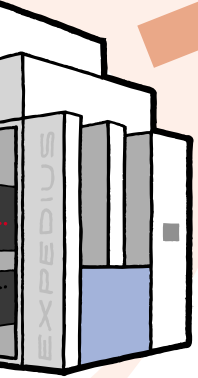


6 Shipping and delivery

We have begun using low-emissions trucks for deliveries to domestic customers. For overseas customers, equipment is packed in wooden frames and is usually air-delivered. Scrap lumber from the wooden frames is recycled and other measures are taken to minimize the environmental burden in this stage.

5 Manufacturing

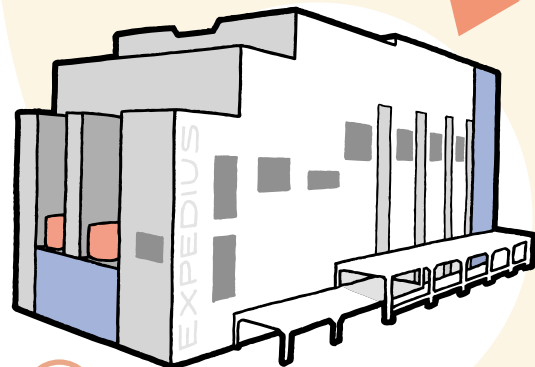
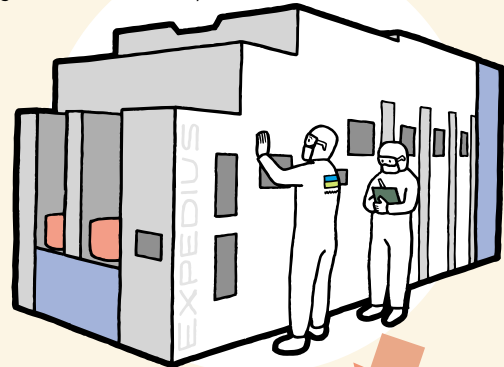
An important feature of our units and modules is how easy they are to integrate and to dock with each other; this reduces the environmental burden involved in assembly and inspection. The wastes generated during those stages are all recycled. Pure water is recirculated and cleaned in the Saga plant, reducing our water usage and lengthening life of components used to produce pure water (see p. 23 - 24). Another important factor to consider is safety (see p. 26 - 27).



Customer's facility (a semiconductor production plant)

7 Start-up and inspection

The equipment is started up in the customer's plant. It is essential to follow procedures – our motto is "Safety first" – when handling the dangerous substances used in this equipment. Several pieces of equipment are brought into the customer's plant. Sometimes, start-up must be carried out on a 24-hour time schedule, with teams trading shifts, as necessary.



8 Production of semiconductors

Semiconductor production equipment is operated 24 hours a day for the constant production of semiconductors. Customers allow only brief stops of the equipment for maintenance, so it must be possible to perform all maintenance work properly in a very limited time. We are also keenly aware that, according to life cycle assessment, a great portion of the total environmental burden of our equipment occurs during semiconductor production. Reducing that burden is a top priority.

About the auto wet station EXPEDIUS: Very fine impurities such as particles and dust cause fatal damage to semiconductors, which contain extremely fine circuitry on their surfaces. From the time the wafers are first brought into clean rooms until production of the devices is completed, they are cleaned with hydrochloric acid, sulfuric acid, fluoric acid, pure water and other substances before and after every single process in order to remove the unwanted substances. Different kinds of cleanings are required before and after the different processes, so the versatile auto wet station EXPEDIUS is capable of a variety of cleaning methods.