

## Engineering

### Ensuring High Reliability with Repeated Testing, Starting in the Engineering Phase

In order to improve product quality, engineers carry out repeated performance testing on prototypes in the initial engineering phase. Casio thoroughly tests product performance in diverse environments by measuring resistance to drops or falls, vibration, light, and saltwater. Testing is conducted under high and low temperatures, and in dry and humid circumstances, and the effects of a power failure or static electricity are also checked. Take for example the DT-X8 handheld terminal, which is often used high above the warehouse floor. In order to ensure it could withstand a drop from three meters, engineers incorporated shock-absorbing material and took extra steps to reduce product size and weight. Casio tested the product using its own drop-test equipment to see whether the handheld terminal could withstand the rigors of actual usage environments. The product's dust and water immersion resistance was also tested. This shows how Casio strives to create products that are reliable in every way. Not relying only on theoretical tools such as blueprints and simulations, Casio engineers conduct thorough physical performance testing. Only after the engineering process has secured the quality it takes to ensure that customers will be able to use the product confidently for a long time, is the product drawing sent on for manufacturing.



A custom-made drop tester at Casio (350 cm automatic lifting type)

# Quality Policy

No matter how great the performance specs of a product may be, ensuring superior quality is still the key to customer confidence. From the initial engineering phase to the release of the final product, Casio takes great pains to ensure there are no compromises on manufacturing quality.

## Manufacturing

### Operating an Uncompromising Global Production System

The Casio plant in Yamagata, Japan, has a premium production line that makes only the high-end, flagship models in the OCEANUS, G-SHOCK and PRO TREK watch brands. Even on the automatic assembly line for precision analog watch movements, the goal is nothing short of zero defects. The company uses special machines that accurately incorporate the tiny components, followed by inspections based on image recognition. Then, top certified personnel with specialized skills put the watches together at the final stage. These experts are responsible for the subtle positioning adjustment of the watch hands, a job that still requires a human touch. Behind these high-quality Casio products

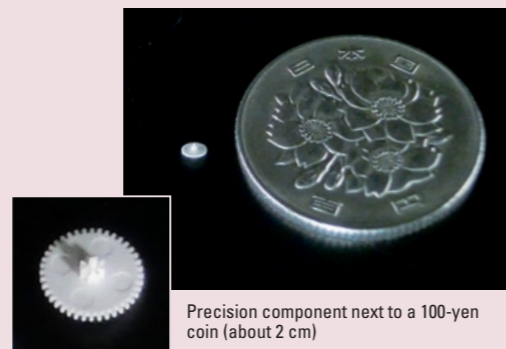
is a manufacturing method that combines the accuracy and efficiency of cutting-edge equipment with the finest human sensibilities. Casio has transferred the spirit of craftsmanship and manufacturing expertise it has developed in Japan to its production sites in other countries. They maintain the same high level of product quality. At a new Casio plant in Thailand, for example, a clean room environment has been adopted for the molding line for plastic components to strictly control process contamination. The plant has built a stable mass production system that reliably turns out high-quality products.

## Precision Part Processing

### Processing Tiny Components with Micron-Scale Precision

Product quality cannot be increased without improving the precision with which each tiny component is processed. At Casio, plastic components are created in molds poured under strictly managed conditions. These molds are not permitted to vary from engineering specifications by more than one thousandth of a millimeter. These precision requirements are understandable, considering, for example, the tiny hard-plastic gears used in the movements of Casio analog watches. The smallest of these gears measures only about 2 millimeters in diameter, and the diameter of the shaft protrusion, which receives the rotational force, measures a mere 0.6 millimeters. To ensure that the gears turn smoothly, the outer edges have a series of fine teeth. If the meshing of these teeth

is too loose or too tight, then the product will not perform with high quality. Casio employs its high-precision processing technology to make components that keep its products operating properly, and lasting for years. That's what Casio customers count on.



Precision component next to a 100-yen coin (about 2 cm)



Premium production line in Yamagata, Japan



Plastic molding line in Thailand

