



Japanese Beverage Manufacturer Streamlines Bottle Design with 3D Printed Mold

Juggling Ideas on a Tight Timeline

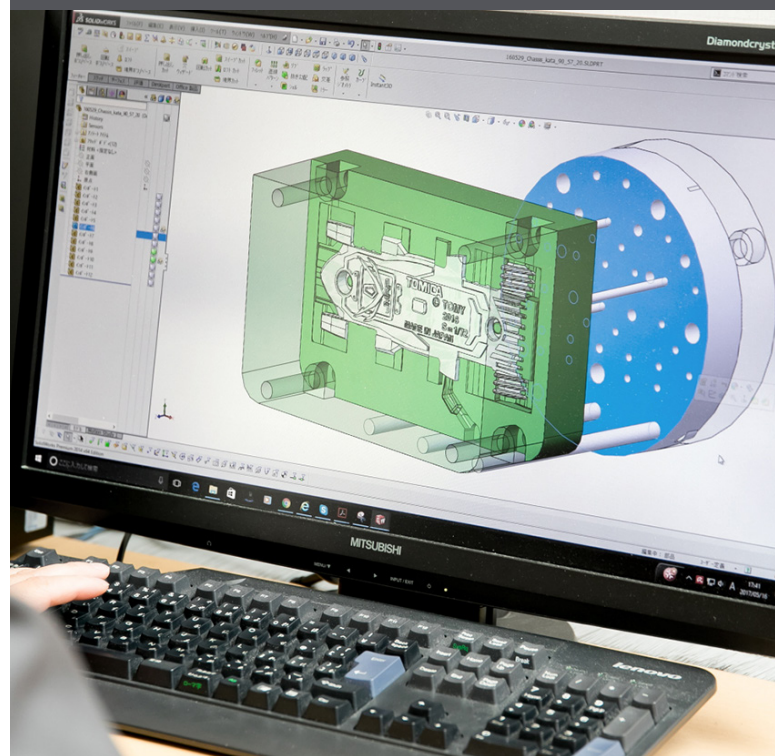
Suntory Group, a Japanese brewing and distilling company, is a global leader with annual sales of approximately 2.6 trillion yen. Established in 1899, it is one of the oldest companies in Japan that distributes alcoholic beverages and soft drinks as well as health and wellness products.



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The time needed for trial production evaluation was shortened from one and a half months to three days, and the product design was also significantly improved.”

Tatsuki Kado
Senior General Manager,
Packaging Material Department,
Supply Chain Management Division





Suntory MONOZUKURI Expert Ltd. performs manufacturing functions for various companies within Suntory Group and is responsible for quality assurance, development and introduction of production technologies, and training of manufacturing personnel across the whole value chain. It's also tasked with improving the overall efficiency of the supply chain, cost control and other areas.

Unlike other beverage producers that outsource concept design works, Suntory has its own concept design department. When developing a new plastic bottle, the marketing team first comes up with a product concept, which designers then convert into a design sketch. Next, package engineers and product engineers brainstorm together to finalize the product concept.

Repeated trial productions and evaluations are then conducted to perfect the design.

Once a plastic bottle design was finalized, it would take somewhere between six and nine months before production could begin. That's because Suntory had to purchase aluminum molds from external manufacturers, which prolonged the lead time. This hurdle in the process often led the team to abandon new design ideas because of time restrictions.

Another challenge was realizing quality designs that were both lightweight and complex. Balancing these objectives and meeting extremely high design standards became particularly difficult over the years.

A Move to Make Molds In-House

In order to shorten the lead time, the company first tried using computer simulation and a cutting machine. To their disappointment, simulation required a relatively long computing time and there was a slight deviation between the actual data on beverage bottles and the calculated result. When the cutting machine was used for mold making, there was no problem with the products, but setting the CAM and machine was time-consuming.

It was then that Suntory started to flirt with the idea of using a 3D printer to make molds. “When looking for a method to shorten the lead time, we found that resin could replace metal, and a 3D printer can make the molds inside the company,” said Takashi Akiyama from Packaging Material Department.

During the “blow molding” procedure — a plastic processing method of forming the hollow shape of beverage bottles — the mold had to be able to endure the heat and air pressure that is present in the process of forming. Additionally, the mold surface had to be smooth enough so the appearance of the plastic bottles would not be affected.

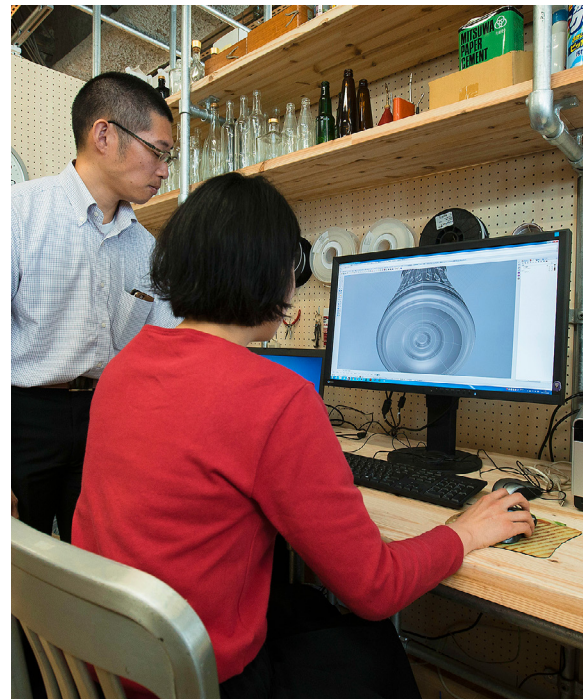
With these molding requirements in mind, Suntory decided that Stratasys® PolyJet™ technology and the Objet Eden 260VS™ 3D printer would provide the perfect solution. “In view of its applicability to various types of resin and excellent forming speed, we chose the Objet Eden 260VS,” said Takashi.



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**Packaging Material Department,
Supply Chain Management Division**



An Immediate Boost in Production and Accuracy

When traditional molds were used for trial production evaluation, the process took about one and a half months. However, when Suntory introduced the use of resin molds made by the Objet Eden260VS 3D printer, the time it took to complete a trial production evaluation decreased to as little as three days — which increased the number of trial productions they were able to complete in a given timeframe.

In addition, some package engineers were trained to use 3D CAD because of the 3D printer and could now discuss 3D CAD drawings with concept designers. This resulted in a dramatic improvement in the accuracy of each evaluation. “Because it sometimes only takes three days to complete a trial production evaluation, concept designers, marketing personnel, package engineers and product engineers can have communications based on the actual trial product and data,” says Tatsuki Kado, Supervisor of Packing Material Department, SCM Division.

Taking 3D Printing Groupwide

The news of Suntory MONOZUKURI Expert Ltd.'s success with 3D printed resin molds quickly spread to other companies within Suntory Group. According to Takashi, “Overseas companies were especially interested in the extremely short trial production cycle, so many companies, including America-based Beam Suntory and Europe-based Orangina Schweppes expressed their intention to introduce this technology immediately.”

Because 3D printing has contributed so much to shortening the package development cycle, Suntory is thinking about applying this technology to their Alcoholic Beverage Division as well as other divisions. “We are considering whether this technology can be used in production equipment to make the production of tools and fixtures more efficient,” said Tatsuki.

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