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CASE STUDY
COMMERCIAL PRODUCTS

Excelling in a Global Marketplace

Using 3D Printing to Drive Innovation and Efficiency

A shift lever alignment check fixture 3D printed with ABS material.

Around the world, from small households to multinational corporations, the drive to save energy unites us all. Established in Udaipur, India, Secure Meters (Secure) is answering that call with innovative products designed to cut waste and reduce the cost of energy consumption. From manufacturing meters to building deep expertise across the entire energy management and conservation ecosystem, Secure has consistently introduced advanced products and solutions that drive efficiency and sustainability. Today the company's presence stretches beyond domestic markets and stands as a multinational solutions provider specializing in revenue management, power quality, and energy efficiency.

Powering Progress Through Continuous Innovation

At Secure, the focus has always been on helping the customer reduce energy consumption in the most optimal and sustainable way. As a pioneer of several breakthrough technologies, Secure remains committed to continuously enhancing and evolving its products and solutions. Consistent with this approach, the company recently upgraded from the Stratasys Fortus 360mc™ 3D printer to the Stratasys Fortus 450mc™ industrial FDM® printer, further strengthening its capabilities to refine and innovate its product range.

The Fortus 450mc plays a crucial role, used primarily to produce fixtures, gauges, and concept models for a wide range of aesthetic and functional testing. By integrating the Fortus 450mc into their research and development processes, Secure has significantly reduced testing timelines while simultaneously enhancing the quality, precision, and overall efficiency of their evaluations. Its rapid prototyping capability allows teams to validate concepts quickly, make informed design decisions, and accelerate product development cycles.

The mechanical department leads the usage and application of the Fortus 450mc, supported by contributions from the UI/UX team. Together, they leverage the printer's advanced capabilities to bring greater innovation, agility, and reliability to Secure's product development ecosystem.

This gear teeth check tool was printed with ABS thermoplastic.

Optimizing Testing with Different Materials

While the research team at Secure works with a variety of materials for test purposes, ASA plastic remains their primary choice. It effectively meets all testing, fit, and functional requirements across product features and complete assemblies.

Additionally, the research departments use materials like ABS-M30 and PC (polycarbonate). PC, with its higher heat deflection temperature and greater strength, has proven to be particularly well-suited for specific testing needs. Looking ahead, the research team is also planning to explore ULTEM™, a high-performance material known for its exceptional temperature resistance, to further expand their testing capabilities.

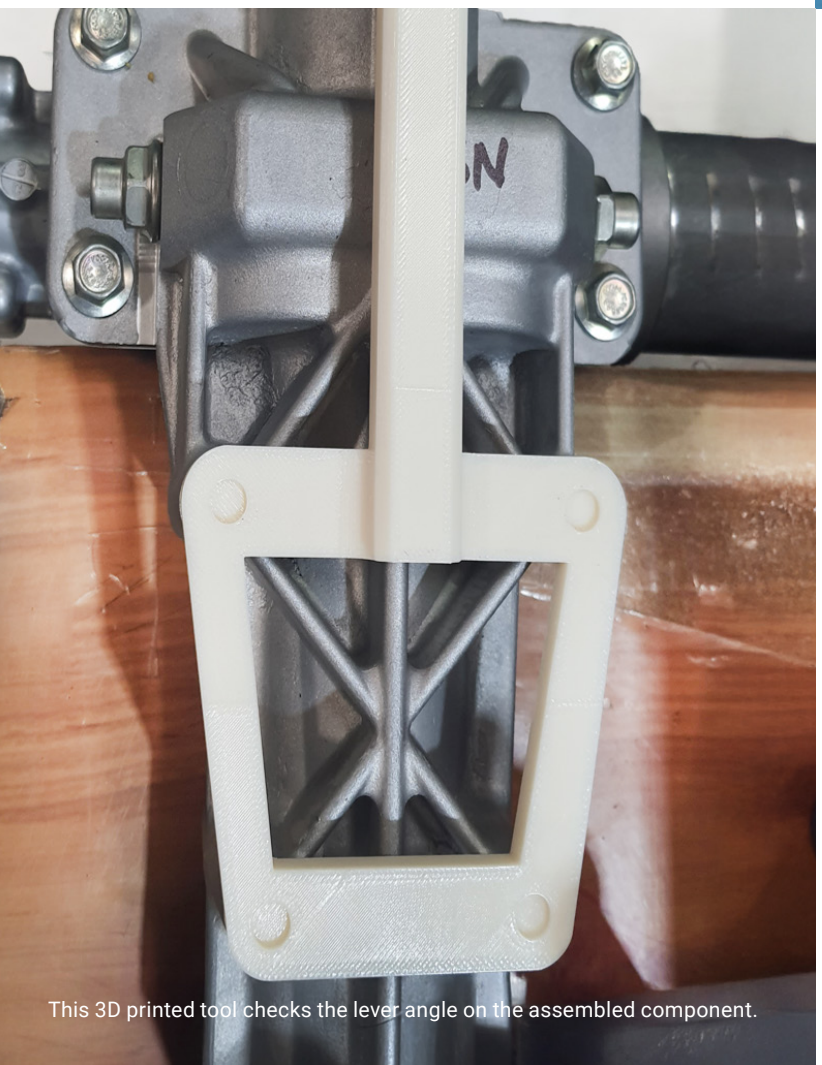
A gear tooth check fixture printed in black ABS material.

Designing Excellence: Meeting the Finer Demands

In addition to the fundamental requirements of a 3D printer, such as speed, accuracy, and cost-effectiveness, Secure also places a strong emphasis on achieving aesthetic designs and high-quality finishes. This is essential, as their products are intended for residential, commercial, industrial, and workplace applications.

The Fortus 450mc seamlessly meets the frequent need to develop new prototypes and conduct rapid testing within strict timelines. Its higher precision, reliable performance, and large build volume make it ideal for quickly and efficiently producing high-quality prototypes.

The check tools can be printed in any configuration to meet the needs of the particular assembly.



This 3D printed tool checks the lever angle on the assembled component.

The Innovation Journey: From Evaluation to Execution

Before upgrading to the Fortus 450mc, the teams at Secure conducted a thorough comparison between FDM, SLA, and SLS technologies. FDM technology was selected for its ease of post-processing, high-performance materials, low maintenance requirements, simplified part programming, and highly reliable builds with minimal failures.

With the continued support of DesignTech Systems, a leading engineering services provider, Secure has been able to push the boundaries of innovation, developing modern solutions that cater to residential, workplace, and industrial needs across the globe.

From Traditional Crafting to Advanced 3D Solutions

Before adopting 3D printing, the development process at Secure Meters primarily relied on handcrafted and machined parts.

“While effective, these traditional methods were often time-consuming, labor-intensive, and costly. Every iteration required significant manual effort, limiting our ability to experiment with new designs and slowing down our overall innovation cycle. The introduction of 3D printing technology has been a game-changer for us. It has dramatically reduced both the time required to produce prototypes and the associated manufacturing costs,” says Mr. Arnav Mathur, senior mechanical design engineer at Secure Meters.

“As a result, our teams now have the flexibility to explore multiple design alterations, conduct rapid iterations, and validate concepts more efficiently than ever before — all while maintaining a high standard of quality and precision.”

With 3D printing technology, creating a particular prototype sample has become much simpler, which otherwise was not feasible with the conventional in-house technologies. Even if Secure decided to outsource the 3D printing, the process would have taken nearly five times longer and incurred twice the cost compared to doing it internally. The accessibility of advanced in-house 3D printing enables Secure’s research teams to work within tight timelines, better control project budgets, and bring innovative products to market faster.

This story was developed and shared by DesignTech Systems, a Stratasys platinum reseller in India.

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> “Overall, 3D prototyping has not only accelerated our product development cycle but has also expanded the possibilities of what we can create and test, helping us stay ahead in a competitive global market.”
>
> **Mr. Shikhar Pandey**
> Mechanical Lead Technical Architect

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