

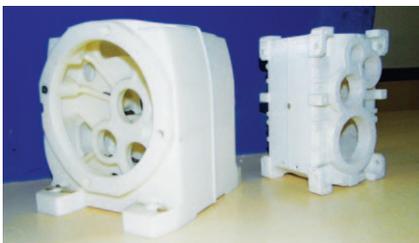
## Geared for growth

How Premium Transmission accelerated product design cycle and enhanced process efficiency using 3D printing technology as a fitting solution.

**P**remium Transmission Ltd (Premium), part of the industrial conglomerate Thapar Group, has strived to produce first class mechanical power transmission products since 1961. The company produces high-quality gear-boxes, geared motors, fluid couplings and other machinery components in four manufacturing plants across India, and serves the global engineering industry, particularly in Australia, South Africa, Middle East Asia, North America and Europe.

### The right solution for a demanding industry

As requirements for engineering components become more complex and diverse, product designers at Premium found it increasingly difficult to keep up with the fast-paced market. Constant development of new, innovative designs was costly and time-consuming using traditional fabrication methods. Premium needed to accelerate the product design cycle and enhance process effi-

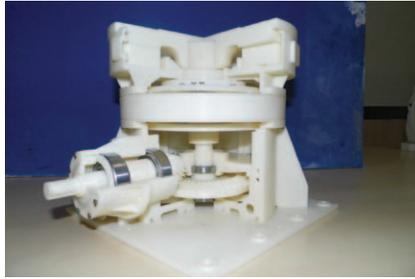


Models created using FDM technology.

ciency, and 3D printing technology was a fitting solution.

“Precision is paramount to us even at the preliminary stage, because any error in the smallest component may lead to huge gaps in the production stage, resulting in extra costs, prolonged design and production time, and material waste,” said Soumendu Mukhopadhyay, DGM-R&D, Premium Transmission Ltd.

Before adopting 3D printing, Premium’s R&D department made



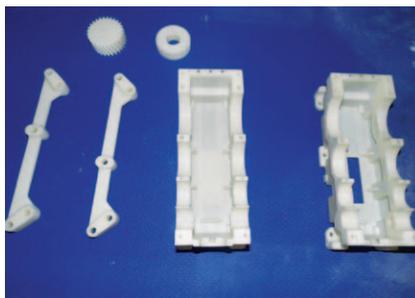
A working model.

prototypes using traditional manufacturing methods such as metal-cutting or casting. Production of one part using this methodology took about three to six weeks and required extra material.

Creating a modular planetary unit that coupled helical gears and a variety of components involved a series of steps through casting, fabrication and gear generation methods and assembly of small components. Often the prototyped components could not be assembled together due to design and manufacturing errors and required multiple iterations. Engineers doubted whether the parts could withstand quality testing, and feared confidentiality breaches with outsourcing.

### Maximising potential with in-house prototyping

Premium invested in a 3D printer based on FDM® technology to produce prototypes for its entire range of products and components in house.



3D printing has eliminated design constraints.

Engineers could create the modular planetary unit in 3D CAD and produce the prototype in one print, saving time and resources while keeping the designs confidential. The same modular planetary unit that once took up to six weeks took Mukhopadhyay and his team only a few days. And any necessary design iterations were edited easily in CAD and 3D printed for form, fit and functional tests.

“By moving from traditional manufacturing castings to in-house 3D printing, we have saved an average prototyping time of three to six weeks and reduced cost from USD 1,000 to USD 250, enabling us to meet the tough demands of the global engineering industry faster than ever before,” said Mukhopadhyay.

Today, Premium has become a major player in the highly competitive transmission engineering industry, and is looking forward to bringing more innovative and productive engineering parts to the machinery world.

Method	Cost	Lead time
Traditional castings	\$1,000	45 days
In-house FDM technology	\$250	4-5 days
Savings	\$750 - 75%	40 days - 90%

“3D printing has eliminated design constraints and empowered our engineers to come up with better and more innovative products while minimising prototype turnaround time and production cost. We are now ready for more frequent product launches and can take on new requests with more complex designs than ever before,” said Mukhopadhyay, in conclusion. ■

(Courtesy: Premium Transmission Ltd, Pune-based DesignTech Systems Ltd worked with Stratasys to develop the appropriate solution for the company)