



Instrumental Advancements

HIGH-END MICROSCOPES AND MEDICAL DEVICES DESIGNED WITH THE HELP OF 3D PRINTING

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– Neeraj Jain, Labomed

CASE STUDY



3D printed binocular body cover of the Labomed Binocular Microscope

Helping scientists shed new light on the microscopic world around us is at the center of what Labomed does. Based in India, Labomed’s research and development team creates a wide range of high-end ophthalmic diagnostic devices including a professional stereo microscope, slit lamp, surgical microscope and colposcope for the pharmaceutical and bioengineering, ophthalmology and gynecology industries. Since its establishment in 2006, Labomed’s high-quality products have made it one of the top 10 brands in medical diagnostic devices globally.

Focused on creating flawless products, founder Neeraj Jain and the Labomed team looked to 3D printing to help improve design quality, quicken the product development cycle and keep up with growing demand.

Magnifying Innovation

Labomed initially relied on China-based service bureaus for 3D printed prototypes to verify concepts and functionality. However, outsourcing was time-consuming and difficult due to miscommunication with vendors. Also, working with strict validation schedules between India and China did not allow enough flexibility during the design review process.

“It was a Catch-22 for the team because it seemed that we had to forgo innovation to make time for quality. There was no room for any rough designs or ideation when we outsourced our prototyping because we had to meet tight production and launch schedules,” said Jain.

Outsourcing 3D printed prototypes was not only time-consuming, but it amounted to substantial costs with less than desirable results. Ordering one prototype could take as long as one month and cost INR 25,000 (USD 383). Plus, prototypes created by vendors using powder-based 3D printing were breakable and inaccurate. In-house 3D printing also allows for validation earlier in the design, helping avoid the costly need for changes at the end of the design process.

To save time and money, Labomed acquired their own 3D printer from Stratasys. With 3D printing in-house, the R&D team conceptualizes ideas and creates mock-ups as soon as their CAD files are ready. Engineers no longer need to wait one month to hold printed models in their hands. Prototypes are ready within two to three hours, and cost around INR 12,000(USD 180), giving designers the freedom to test and iterate innovative designs.

Bringing Success into Focus

One of the most-printed components is the body cover for the Labomed Surgical Zoom Microscope, which enhance the focusing mechanism of the binoculars on the instrument. To finalize the design of the cover, designers and engineers print prototypes to test the assemblies, living hinges and fit prior to mass manufacturing. The printed body cover prototypes are tested for cracks or leaks before painting, and patterns are added for look-and-feel assessment.

“It would have taken us months to come up with the final binocular body cover design through a service bureau, but using the uPrint 3D Printer has streamlined the prototyping process, a huge benefit for us,” said Jain.

With the drastic reduction in time and cost spent on prototyping, Labomed’s designers and engineers now focus on researching and generating new designs without worrying about meeting tight deadlines.

“The uPrint has resolved our design problems and has been one of the key elements that transformed our operations process,” said Jain. “We can now observe finer details in printed parts, identify design errors earlier and ensure best-in-class products for our customers, all achieved in half the time and cost. Even our sales and marketing staff is ready to take on challenges and showcase new products and concepts with the highly precise 3D models.”



The 3D printed binocular body cover painted white on the left side



3D printed ring light painted red

3D PRINTING	TIME PER PART	COST PER PART
Outsourced	28 days	\$383.00
In-House	Less than 1 day	\$180.00
Savings	27 days	\$203.00

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