3D Printed
Dental
Solutions

NEO Lab increases
accuracy and
decreases manual
labor with Separator
Digital Materials (DM)

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The cool thing about the
whole Separator DM process
is that we were trying to fix
one problem, which was to
improve the finish on our
appliances, and we actually
fixed a lot of other problems."

Christian Saurman
CEO NEO Lab

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During a visit with Christian Saurman, the CEO and co-owner of NEO Lab, a family-owned digital orthodontic lab in Andover, Massachusetts, the Stratasys team wanted to learn how our technologies could make the day-to-day easier for their 120 employees who work with about 3,000 orthodontic and pediatric dental clinics around the country.

Saurman explained how time-consuming and messy it is to create acrylic devices using a traditional separator liquid because it requires careful application, more product and it tends to bleed around the model. It also takes longer to dry and because it's hard to remove the appliance from the model, the model can easily crack. He liked how the support layers printed on PolyJet act like a natural separation to release the acrylic. And if Stratasys could figure out a way to infuse more of the separator into the final layers to make the device easily pop off it would be a game changer.

This discussion evolved into the development of the Stratasys Separator Digital Materials (DM). Separator DM infuses with the model resin, easing the separation of the acrylic device from the model — making the removal of wax and acrylic residues easy — resulting in better surface quality and decreased manual labor.

This game-changing feature was developed in partnership with Saurman and his team, which included fine-tuning the amount of support and model material needed to release the acrylic in order to achieve a better finish underneath the appliance.

"During production, we're taking printed resin models and marrying them with acrylic resin. These two will bond, and then we've created one big piece of resin that isn't coming apart," says Saurman. "This is the reason we use Stratasys 3D printers for our acrylic work — the layers of support material provide a separation for the two resins that just isn't naturally available in DLP or SLA printing."

Now that Separator DM has been tested and perfected, Saurman says the impact of using it has been "huge" for NEO Lab. The initial reason he wanted to work on this project with Stratasys was to get a better finish on their appliances: "Ultimately, we want a better product that is going out to the offices." But in doing so they found that there were so many other advantages that came out across the board using Separator DM, such as decreased manual labor, increased accuracy and a better experience for the customer.

goengineer
www.goengineer.com

3D PRINTER SALES
info@goengineer.com
800.688.3234

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supplies@goengineer.com
855.470.0647

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AMsupport@goengineer.com
855.470.0647

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Completed 3D print with Separator DM

Decrease Manual Labor.
Eliminate Post-processing.

When using separator DM, Saurman says the only parts that need to be rinsed are the undercuts of teeth and the pedestal, the bottom of the model that sits on the print tray. At NEO Lab, they just use a putty knife to scrape off the support on the bottom and it is post-processed and ready to hit the floor. Whereas before, the model would be completely encased in support and they would have to waterjet it off or put it in the tumbler and tumble off the support.

"We didn't even know that was going to happen with the Separator DM," says Saurman. "And we were super excited about it because before we had one full-time and one part-time employee working 15 hours a day water jetting all the models. Now we are able to shift their workload to something else."

Easy Separation Saves Time, Increases Accuracy.

Saurman says Separator DM saves NEO Lab about three minutes per model. And half of that time-savings is postprocessing, the other half is not having to apply the separator. Before using Separator DM, their acrylic department used to struggle to free the device from the model. Now instead of spending 30 seconds per model it takes NEO Lab five seconds, which really adds up when they are making 550 – 600 appliances a day.

In addition to saving time, the easy separation also helps NEO to increase accuracy. For example, a tech would struggle when prying the acrylic up on a retainer using standard separator. And the wires might have flared up, which would then need to be bent back to the original shape. But with Separator DM, the acrylic easily pops off the model, so the wires stay in place leaving the device highly accurate.

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For us to be able to print Separator DM, on our J720™ and new J5 DentaJet™, and switching out our 260 line to J5s, we can eliminate all the post-processing that has to happen with these models. We don't even need the tumbler."

Christian Saurman
CEO NEO Lab

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Better Surface Quality.
Better Experiences for Customers.

In addition to the better surface quality that comes with using Separator DM, the 3D printed models also end up looking really polished, so the dentists NEO Lab works with are giving them to their patients. They even have dentists that present the 3D printed model and appliance in a finished box with their logo as a parting gift.

"The experience is what we are trying to enhance. When I was selling the digital experience, we always talked about the last impression," says Saurman. "You're going to remember the last impression of the office and you're going to remember how they treated you on the way out the door."

"

We used to struggle with the models looking good on our acrylic side because when we run acrylic, it tends to go all over the model. But with Separator DM it all just falls off."

Christian Saurman
CEO NEO Lab

Comparison of model using Separator DM (left) and without (right)

Partnering With
Our Customers

The best product innovations at Stratasys have come from listening to our customers needs and working with them to develop the best solutions possible to improve product quality and workflow. Because of this collaboration, Separator DM promises to be a game-changer for Orthodontic labs who are looking to achieve better surface quality and increased accuracy, while decreasing manual labor. Most importantly, this enhancement offers a better customer experience by delivering superior finished products to their customers.

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855.470.0647

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AMsupport@goengineer.com
855.470.0647

USA - Headquarters
7665 Commerce Way
Eden Prairie, MN 55344, USA
+1 952 937 3000

ISRAEL - Headquarters
1 Holtzman St., Science Park
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000

EMEA
Airport Boulevard B 120
77836 Rheinmünster, Germany
+49 7229 7772 0

ASIA PACIFIC
7th Floor, C-BONS International Center
108 Wai Yip Street Kwun Tong Kowloon
Hong Kong, China
+ 852 3944 8888

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