Ultimaker

Faster, more accurate dental models with 3D printing

"The process before using Ultimaker printers was very long. Each iteration had to be handmade. Now, all iterations can be printed at the same time. With the Ultimaker 3D printer, we ensure consistent, reliable results. The level of detail is impeccable."

— **Marco Lotito,** Co-founder of OpLab

Using 3D printing technology, OpLab can quickly and easily create physical models of dental arches, reducing time, labor, and expenses in the process. The new approach means the team can achieve greater model accuracy, resulting in less error and a better service for their clients.

Company
OpLab s.n.c.

Industry
Dental

Challenge
Before using 3D printing technology, OpLab was using plaster (gypsum) to create dental models, which had to be entirely crafted by hand. This served the purpose, but was highly labor-intensive, particularly if the models needed multiple iterations.

Solution
By introducing an Ultimaker 3D printer into their practice, OpLab can make more accurate models in a fraction of the time, improving quality and minimizing labor. All their iterations are now 3D printed.

Results
- Faster models, all iterations can be printed at the same time
- 10 times less labor involved
- Higher quality

OpLab s.n.c. - Introduction
OpLab is a dental laboratory, specializing in manufacturing of dental arch models. These models are used to assist dental diagnostics and treatment, and they play an invaluable role in the industry. Traditionally, impressions of the patient's teeth were supplied to OpLab, then the team created a number of plaster models.

Using plaster presented a number of issues – mainly because it had to be manipulated by hand after the plaster was fully dry. This made the process very time- and labor-intensive. Introducing 3D printing technology made all the difference. Having an Ultimaker in-house meant that models could be made swiftly and easily, and if any further iterations were required, it took significantly less time. These days, OpLab relies solely on Ultimaker 3D printers to create their dental models, and value the consistent, reliable, high-quality results that the machines offer.

Challenge
The most significant challenge was time. Using plaster held the process up considerably. To create dental models, specialist technicians needed to undertake precise, demanding tasks, such as sawing the model to move each tooth into the correct position, and because all work was undertaken by hand, this meant that likelihood of error was increased. Thermoforming is performed to create every finished model, which is then sent to the patient to wear (for certain periods of time) - and each of these models require hand-finishing.

Solution
3D printing has significantly changed the way OpLab creates dental models. Firstly, the team receives a negative mold of the patient's teeth from the dentist. On this initial mold, they'll perform the plaster casting and finish it with the appropriate tools. The finished model is then inserted into a 3D scanner, which creates a digital model. The digital model is processed using specialist software – which generates all the intermediate iterations, right through to the final model. All iterations are then 3D printed, which takes considerably less time than creating the models entirely by hand.

Results
OpLab states that incorporating an Ultimaker printer into their workflow has improved efficiency and reduced labor. The most notable improvement is the time saved, which in turn, offers economic benefits. All iterations can now be printed at the same time, which enables the team to focus on other important tasks. There's no need to create a model and modify it continuously by hand.

Marco Lotito predicts that, in the future, 3D printing technology will enable companies like OpLab to scrap the use of casting plaster entirely, and to use intraoral scanning instead. This will mean that dentists can gather scans digitally, then labs can use them to create digital models. Patients will never be required to provide a cast again, and dental laboratories will benefit from a more seamless, efficient process.

Marco Lotito tells us that they will continue to use Ultimaker printers in their practice. "In addition to being consistent and reliable, 3D printers allowed us to achieve greater design accuracy, giving them a strong competitive edge in the market."

	Traditional model making	Ultimaker 3D printers
Cost*/model	€15	€0.50
Time/model	3-5 hours	2-4 hours

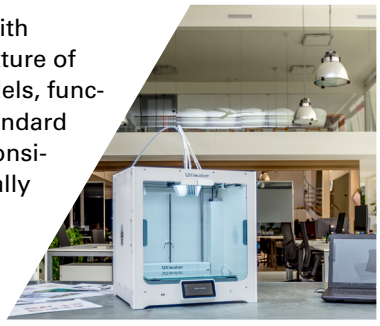
**Material expenses are irrelevant (around €0.50), the traditional model making process involves a lot of manual labor, which effects the model cost.*

After receiving a dental impression from a dentist, OpLab used to create a plaster cast.

All modifications had to be performed by hand which made the process of creating dental models both lengthy and labor-intensive.

The cost of the 3D printed model is just €0.50 on average, and it takes 2-4 hours to create, without manual labor.

Using Ultimaker 3D printers, OpLab achieved significant time savings and removed the need to create and continuously change models by hand.



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