

# FORMLABS

In 2023/24 the product design students in MA-Modul 1 work on an external design project with Formlabs. On 18 and 19 October, we will take a 2 days deep dive into the world of Formlabs at their headquarters in Berlin. Formlabs will offer in depth info on their specific technology and materials, we will learn about common mistakes with 3d printing, and digital fabrication and hear about their aims and dreams. Within the project, we are looking at a number of questions that Formlabs would like to get a response to. You can pick a challenge based on your own preferences and background, but all circle around the theme of Customisation.

## **Customisation:**

Formlabs wants to push the boundaries for 3D printing and envisions interesting futures for customisation. Based on this 5 directions can be tackled, to be cleared up at our visit:

### **1. for nerdy geeks:**

3D printing allows geometries that are far beyond the boundaries of conventional manufacturing, both performance and aesthetic wise. (Topology) optimisation, customisation and parametric design offer ways to improve material use, geometry, ergonomics, aesthetics, etc.

**Q: How can AI be a tool to bring both, 3D printed design and manufacturing processes to the next level, adjusted to specific demands?**

### **2. for concerned creators:**

Formlabs uses sample parts to inform about their products, to show possibilities and to advertise, but these often end in the trash. Shipping them around the globe doesn't make sense from many points of view. How to customise this?

**Q: Which informative, sustainable, impactful, handy sample parts suit Formlabs, that customers like to keep?**

### **3. for mindful makers:**

Within the SLA and SLS technique Formlabs offers a variety of different performance materials and also great chances to combine them, thus extending traditional manufactured parts: Printed 'in place' multi-part assemblies, living hinges, compliance mechanisms, connected parts etc. offer a new way to think about moving parts in the manufacturing and application process.

**Q: How to use new material combinations for circular, sustainable and meaningful personalised products?**

### **4. for the material minded:**

an often overlooked problem is the excess powder of SLS printing. It does not have a proper afterlife yet. Various clients also have various types of leftovers: powder or useless blocks of materials....

**Q: What to do with the excess powder of printing/manufacturing, can it be customised for the various clients within the existing digital way of production?**

### **5. for the system-changers (mass-customisation instead of mass-production):**

3d printing offers opportunities for customisation and individual solutions, but this has challenges, as it relies on a very efficient and lean supply chain set-up, as well as a flexible generally automated production process Accessibility (cost, tech. access, education, etc.) becomes a more and more relevant question

**Q: Which lean workflows enable customer participation in customised creation processes?**

### **Time line:**

- 18 and 19 Oct, 09.30 – 18.00: introductions at Formlabs headquarters Funkhaus Berlin
- 21 November 09.30 – 14.00: interim presentation at UdK Berlin (Str. Des 17. Juni 118)
- 16 Jan, 09.30 – 18.00: set up expo and final presentations of Customisation project

## Resources and Support:

Formlabs will provide the following resources and support throughout the project:

- Access to Formlabs 3D printers and printing materials.
- Technical expertise and guidance on 3D printing technology.
- Mentors assigned to each student team to provide guidance and support.
- Regular check-ins and design reviews to provide feedback and ensure progress.

Deliverables:

- Research findings and analysis of customization trends and target markets.
- Detailed design files and prototypes of customized products or tools.
- Final presentation and documentation summarizing the design process.
- Project report highlighting key learnings and outcomes.

Expected Outcomes:

- Innovative and functional designs leveraging the customization capabilities of 3D printing.
- Enhanced understanding of 3D printing technology and its potential applications.

[www.formlabs.com](http://www.formlabs.com)

## Short & snappy on Formlabs:

Formlabs - founded in 2011 by three MIT media lab students - develops and manufactures 3D printing technology, related software and consumables. 'Formlabs is expanding access to digital fabrication, so anyone can make anything'.

### • 2012:

Formlabs develops the first desktop-sized, easy-to-use, and affordable LFS (low force stereolithography) 3D printer, the **Form 1**. In these stereolithographic 'Form' printers, liquid resin is cured, or hardened, in a solid material by laser light.

### • 2017:

- the first SLS (selective laser sintering) desktop machine is announced. The **Fuse 1** will have a larger build volume than the Form printers, a removable build chamber, and uses nylon powder.

- the **Form Cell** is launched, a cell of Form 2 3D printers, as well as the **Form Wash** a washing machine to clean liquid resin off of printed 3D models and **Form Cure** a postcuring system, completely automated, to be used as a 24-hour digital 'factory'.

- the free software package **PreForm** is provided to prepare 3D models for printing. Some features include automatic model orientation and support structure generation.

### • 2019:

the **Form 3** printer is announced, designed for use by

artists, designers, and other professionals. It offers a larger print area, and a new stereolithography technology that allows smoother surface finish and more detailed prints.

### • 2020:

Form 3L is released. Big SLA parts are now within reach

### • 2021:

The **Fuse 1** (announced 2017) **and Sift** (powder recovery system) starts shipping to customers. Nylon 12 and Nylon 11 are the first SLS materials available for Fuse 1 generation

### • 2022:

- The **Form 3L** is available, including wash and cure and making large parts with exceptional quality a reality.

- **Nylon 12 GF** is released. A catalog of Bio Compatible resins to make Medical 3D printing more accessible

- **Fuse 1+ 30 W** is launched. It increases major print speed and enables Nylon 11 CF and more complex materials

### • 2023:

Form Cell is introduced with the **Form Auto**, which automates the Form printer and enables users to remotely open the cover, start prints, and clear parts off the build platform.