



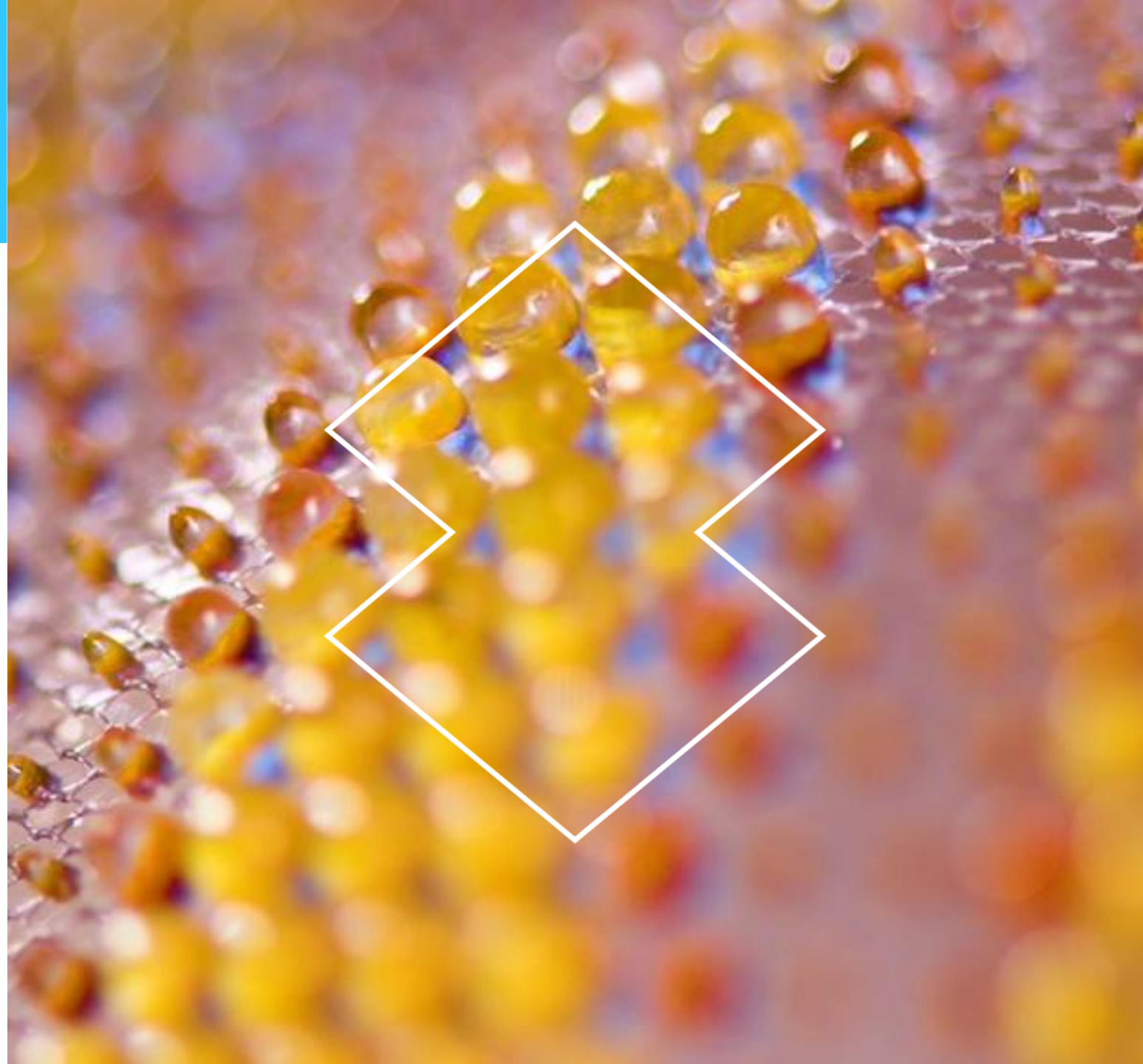
# Stratasys 3DFashion™

Direct-to-textile 3D Printing

**Gustavo Hernandez**

Sr. Application engineer EMEA

[gustavo.hernandez@stratasys.com](mailto:gustavo.hernandez@stratasys.com)



# Stratasys at-a-Glance

## The leading polymer 3D Printing provider

#1

Largest industrial 3D printing installed base in the world

#1

Highest revenues for any public 3D printing provider with **\$572.5M** in 2024

~2,300

Patents<sup>1</sup> supporting our industry leading position

#1

Profitability - **Only profitable publicly-traded 3D Printing OEM**

#1

Market access – **over 130** distribution partners worldwide

**\$150.7M<sup>2</sup>**

Cash and equivalents and no debt

## Multiple technologies & complete solutions for superior application fit

### 5 Technologies Offering



### Industry 4.0 Software Platform



GrabCAD SDKs



nTopology

### Materials Partner Ecosystem



## Customers are leaders in manufacturing, healthcare and consumer industries



LOCKHEED MARTIN



AIRBUS



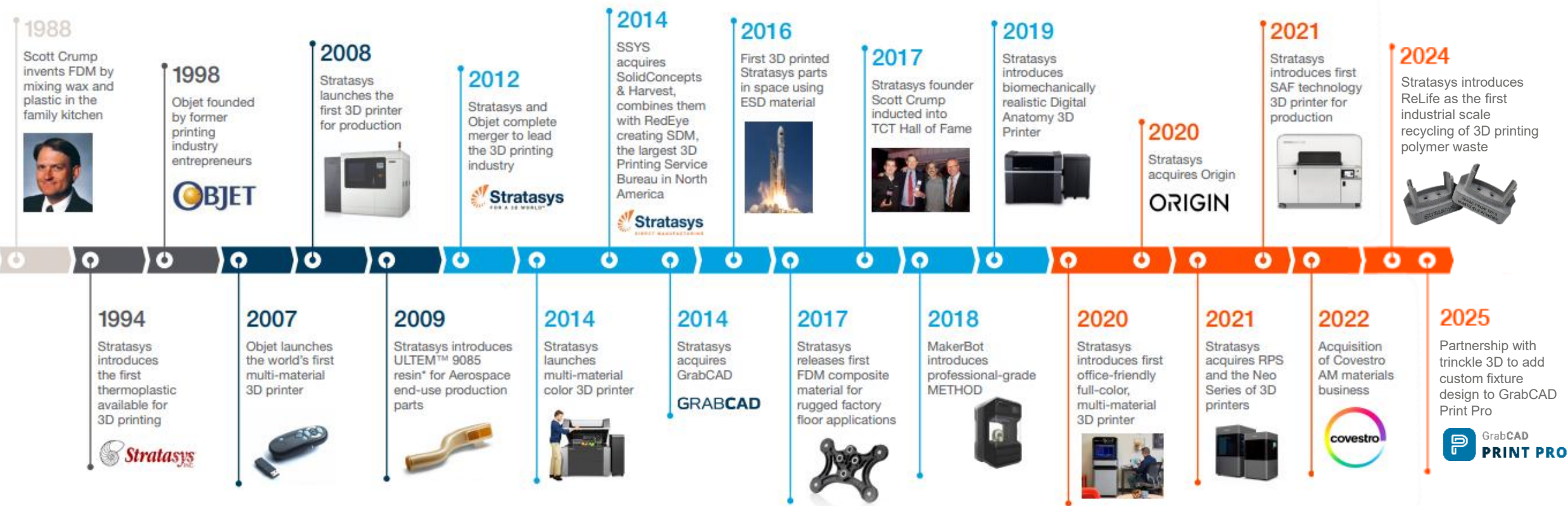
SPACEX



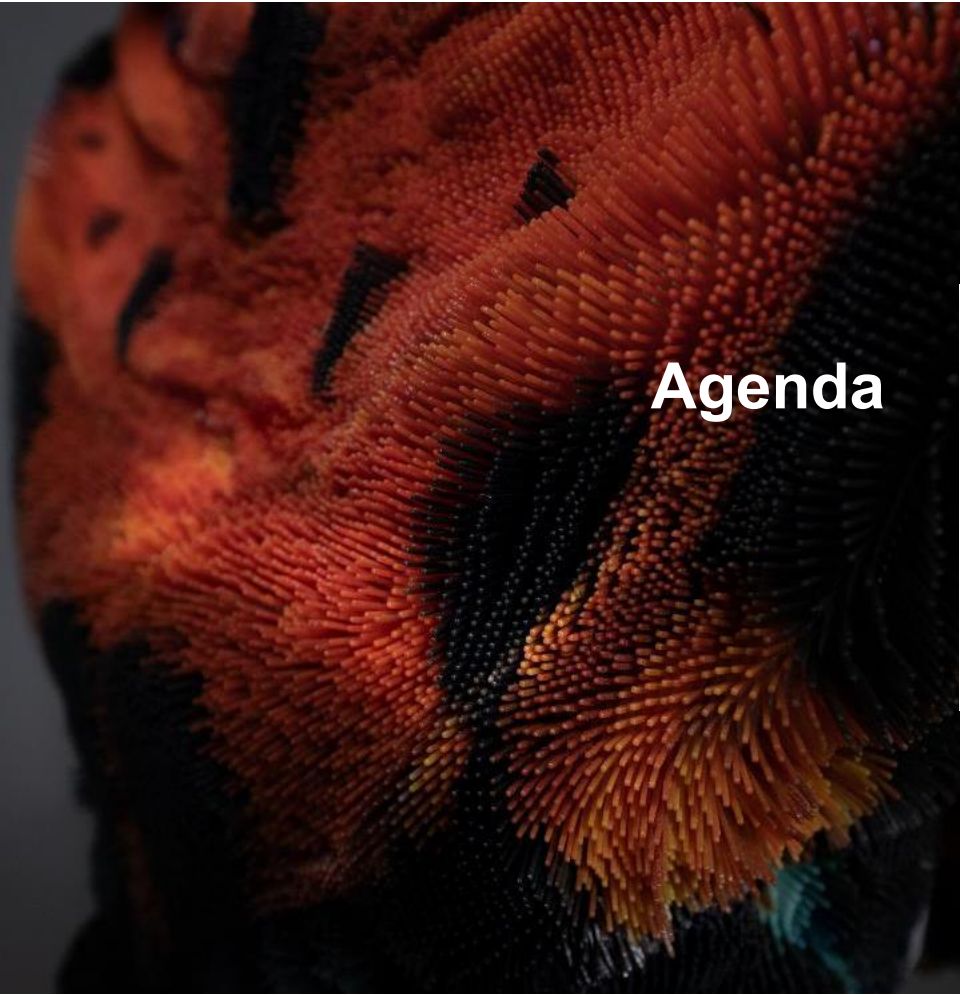
Make additive work for you™

<sup>1</sup> Includes patents granted and patent applications; <sup>2</sup> As of 30/6//2024 from latest filings

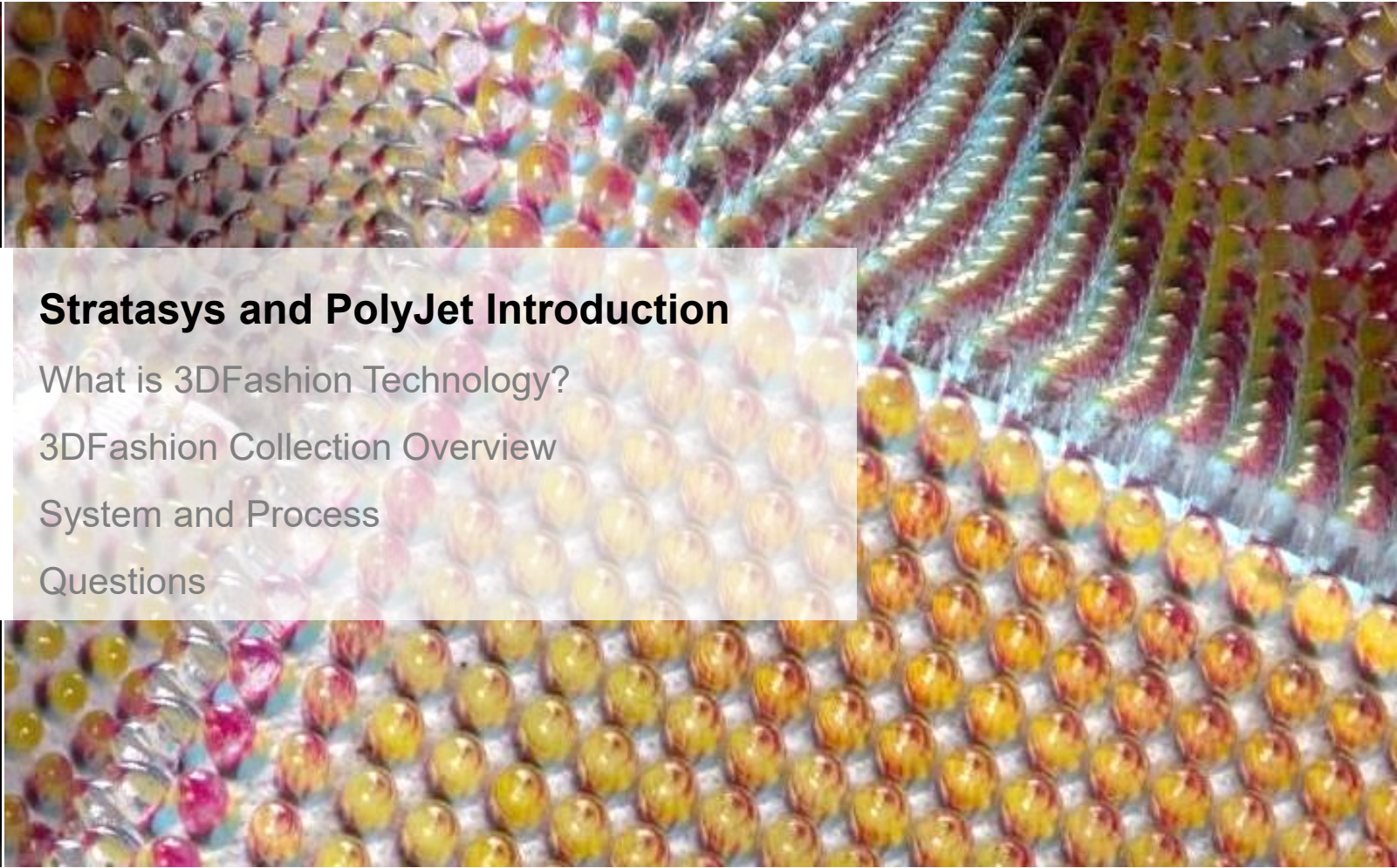
# 35 Years Accelerating Innovation



# Stratasys 3DFashion™



## Agenda



### Stratasys and PolyJet Introduction

What is 3DFashion Technology?

3DFashion Collection Overview

System and Process

Questions

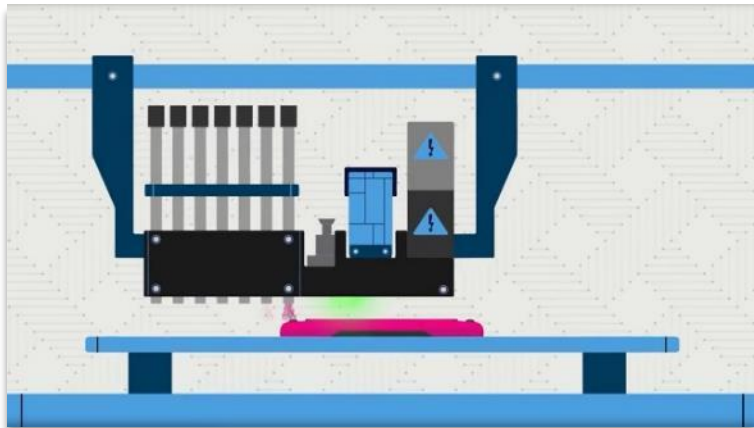
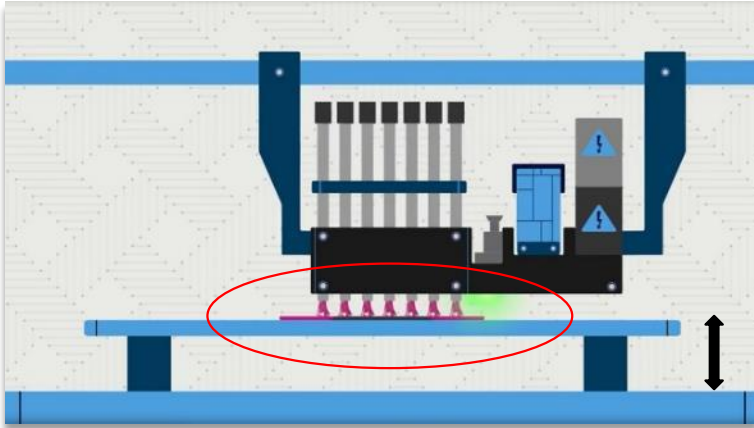
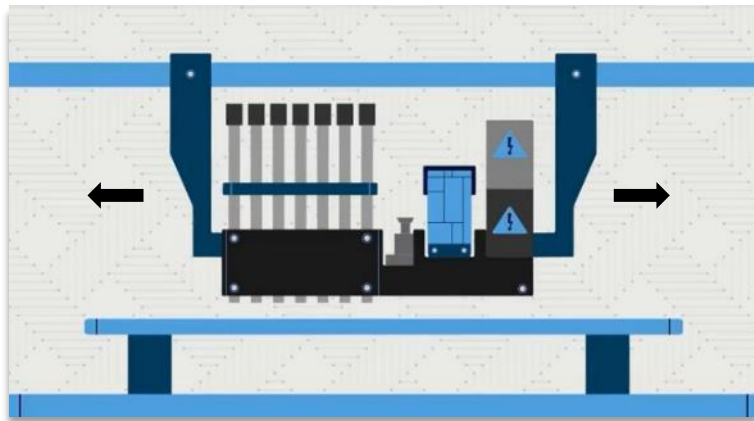
# Polyjet™ Technology

## A quick Recap...



# POLYJET

## Technology



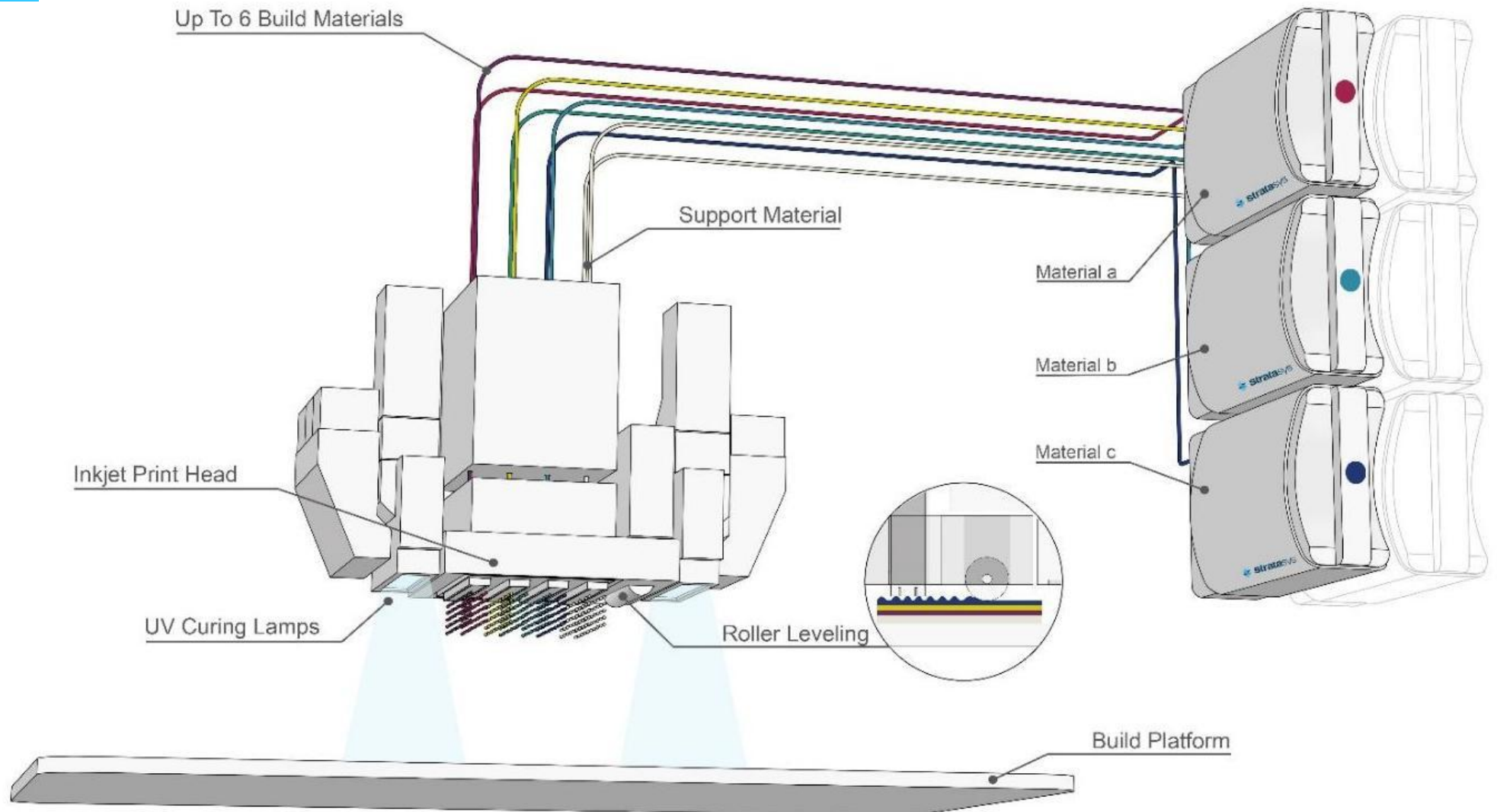
## J8 PolyJet Technology

### How does it work?

- The **printing block** moves along the X-Y axis in order to maximize the printing area coverage and reach the entire build platform.
- The **Build Platform** moves in z direction layer by layer in order to build the entire geometry.
- Drops of liquid **Photopolymer** are deposited on the building tray by the Printing Block, layer by layer.
- **Exposure to UV** light, initiates a very fast polymerization reaction turning the liquid photopolymer into a fully cured ready to use 3D model.
- Polyjet technology is based on Photopolymer resins, UV light and motion working simultaneously in order to produce precise full color patterns and high customization like no other technology.

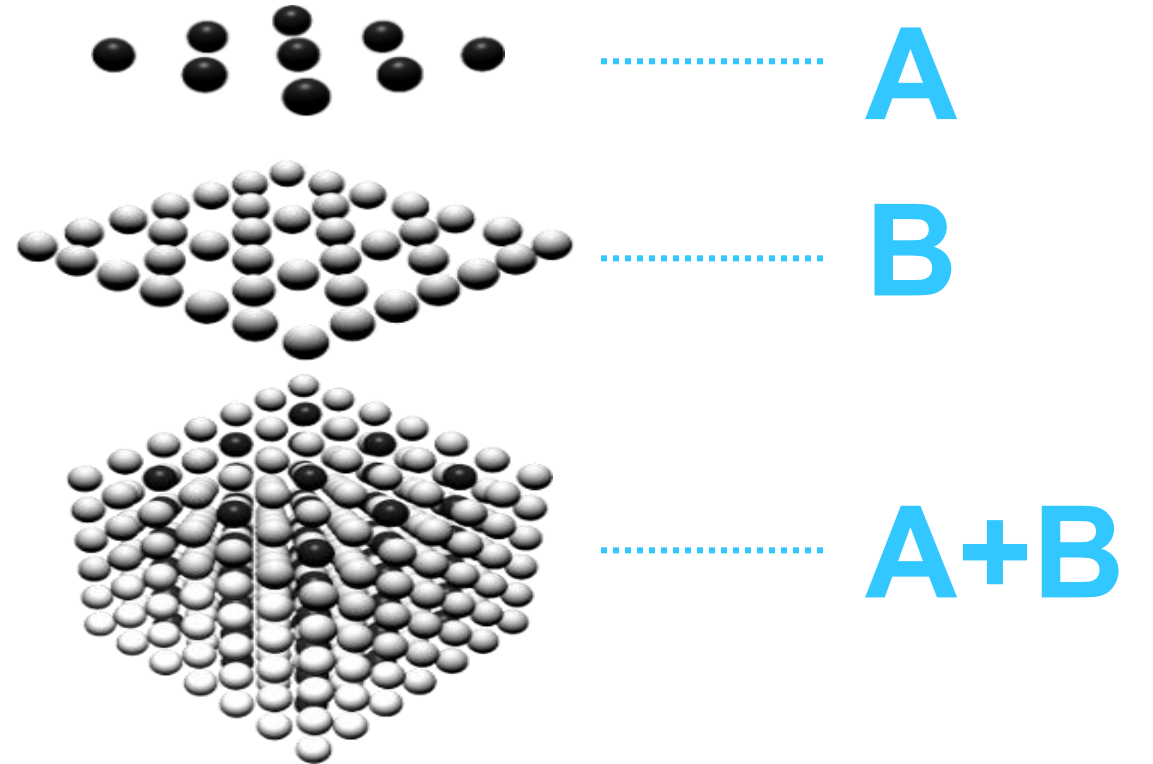
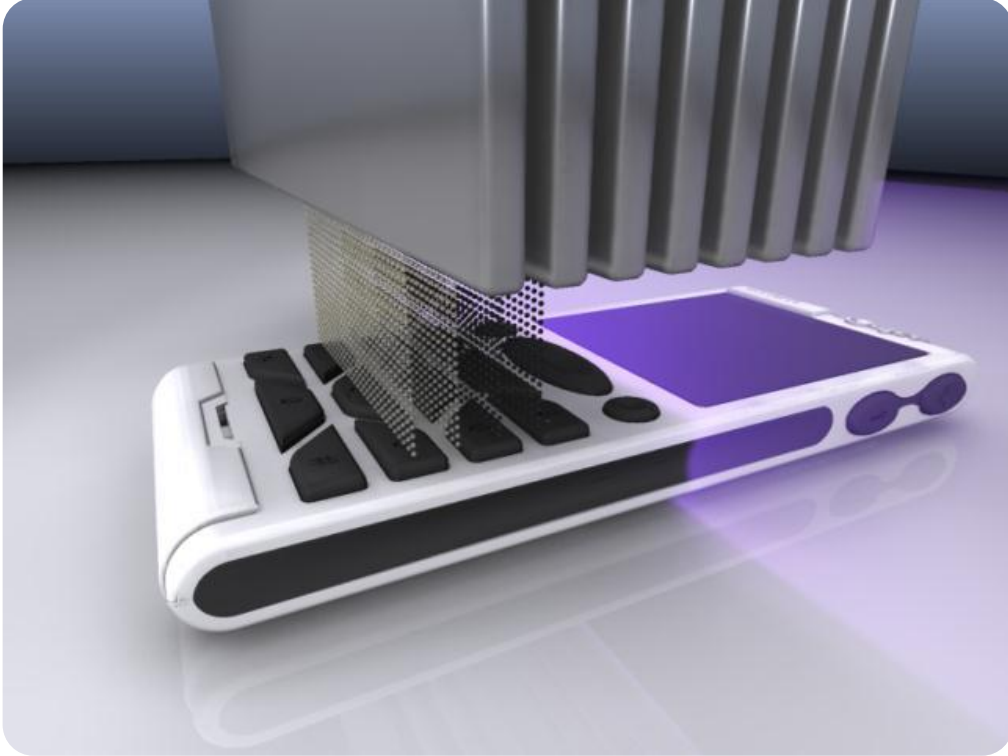
# Polyjet™ Technology

## Multi-Material



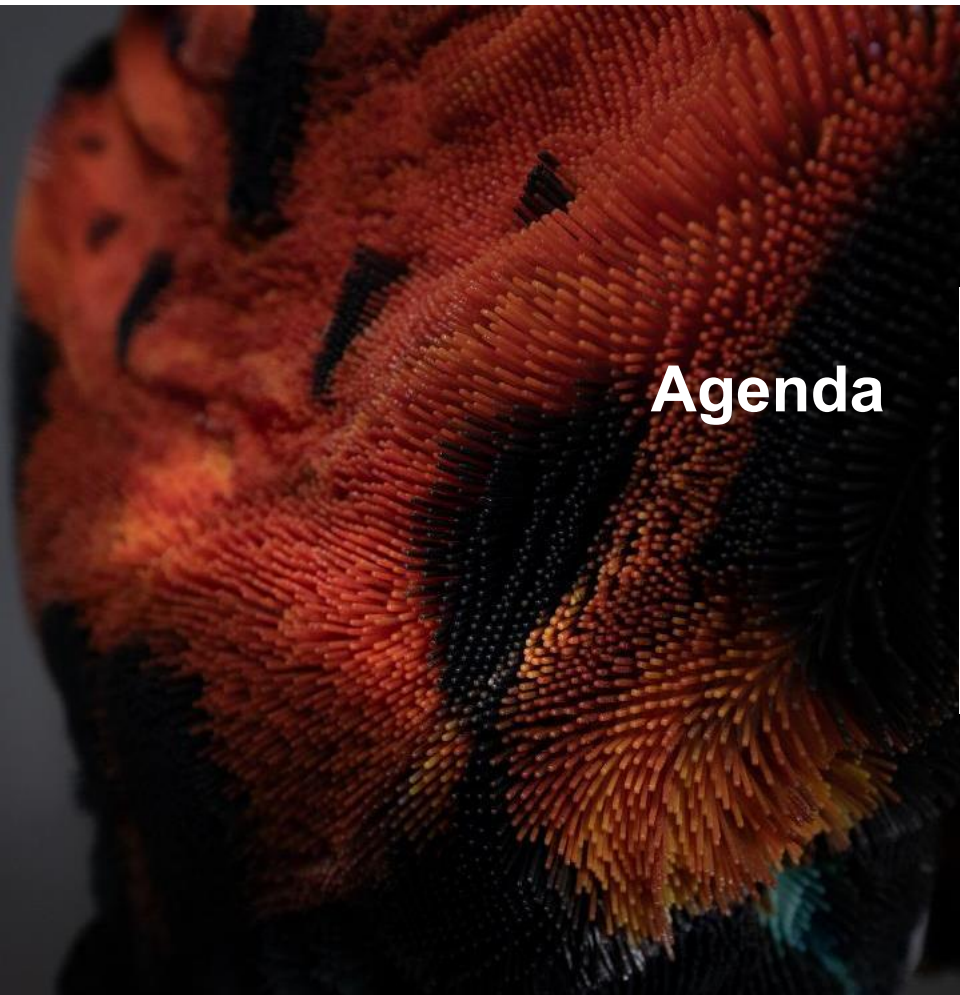
# Polyjet™ Technology

## Multi-Material 3D printing





# Stratasys 3DFashion™



## Agenda



- Stratasys and PolyJet™ Introduction
- What is 3DFashion Technology?**
- 3DFashion Collection Overview
- System and Process
- Questions

2022:

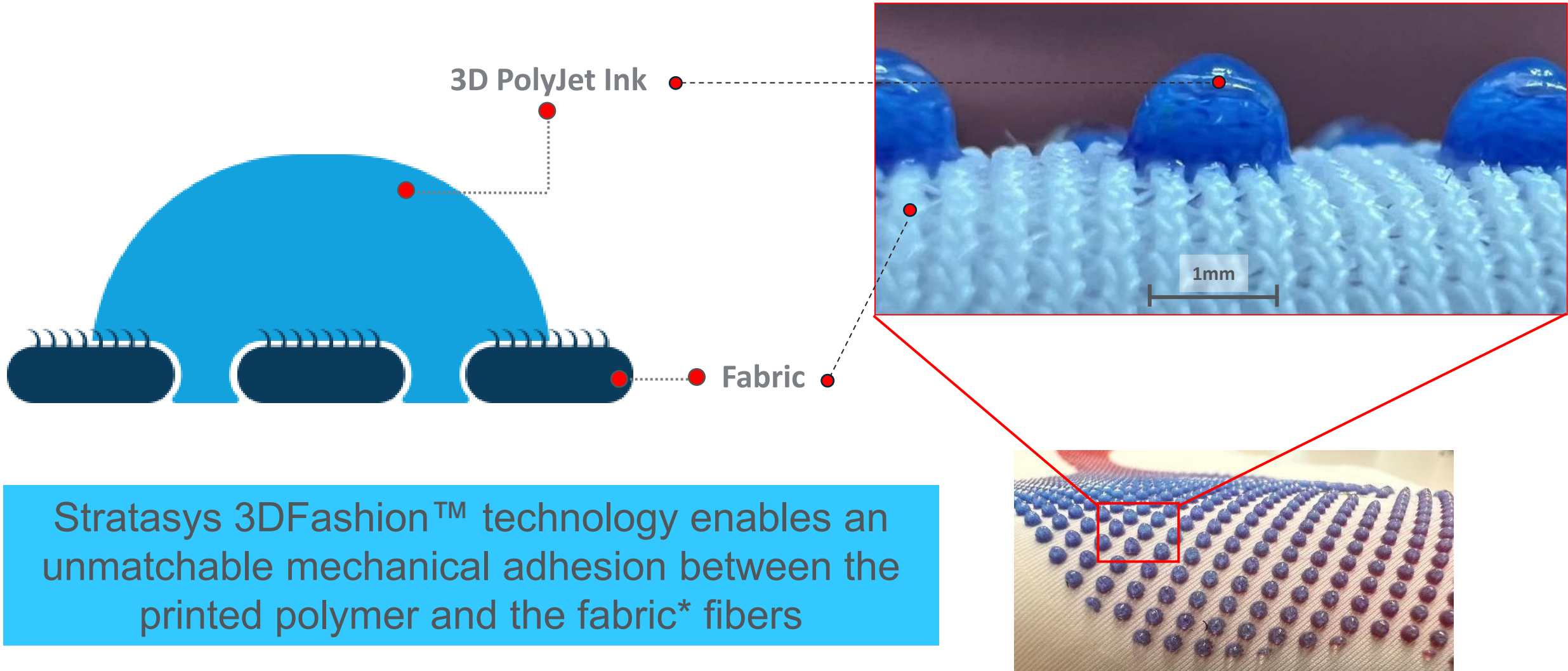
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**3DFashion™ :**  
**Directly-to-Textile**  
**3D Printing**



# 3DFashion™ Technology

## Fabric – Resin Mechanical Adhesion Mechanism



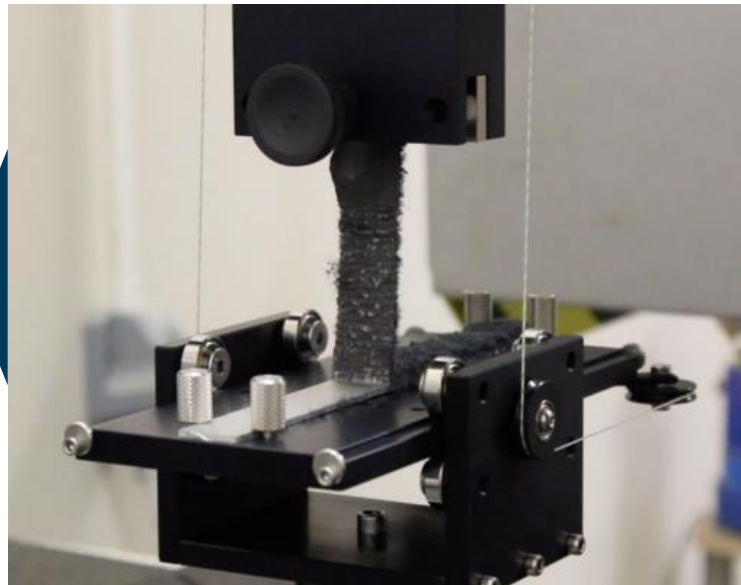
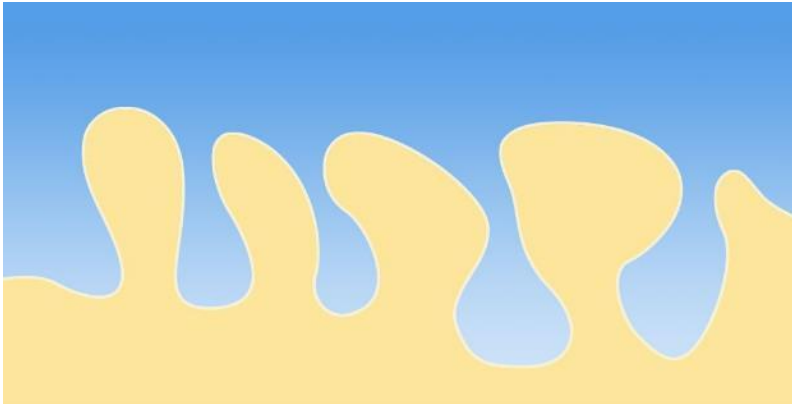
Stratasys 3DFashion™ technology enables an unmatched mechanical adhesion between the printed polymer and the fabric\* fibers

# 3DFashion™ Technology

## Fabric-Ink: Types of Adhesion

### Mechanical

Printed material mechanically interlocking with textile fibers after polymerization process



### Chemical

Printed material connected by chemically defusing with textile fibers material during polymerization process

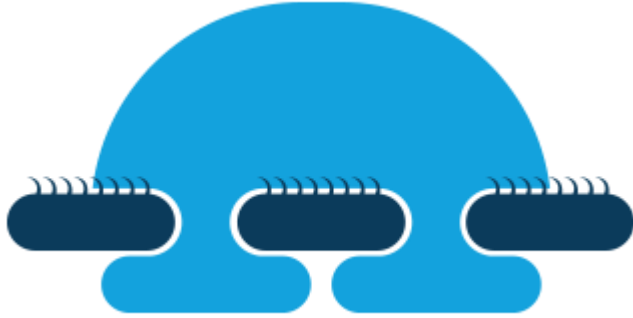


The main adhesion mechanism of 3DFashion technology is mechanically based

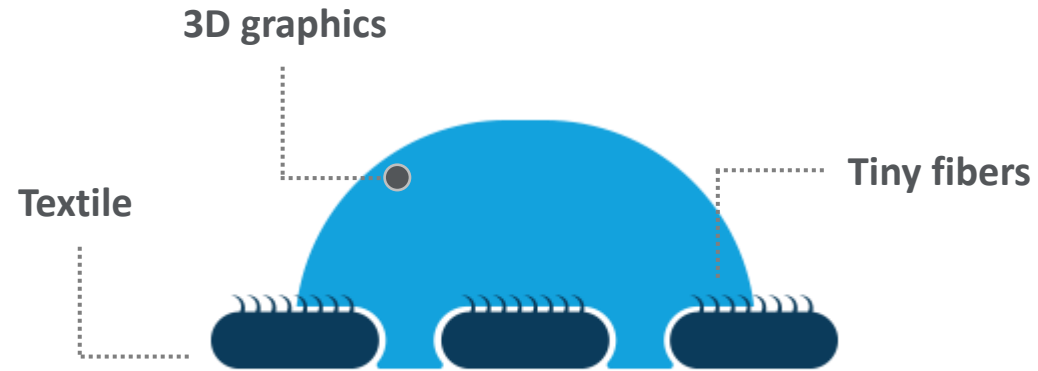
# 3DFashion™ Technology

## Mechanical Adhesion Mechanism

Double side connection



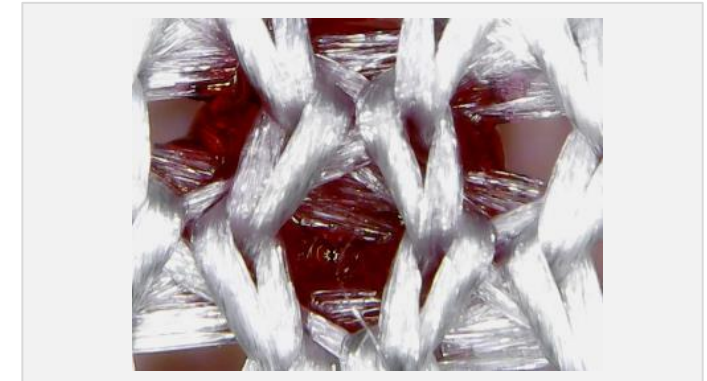
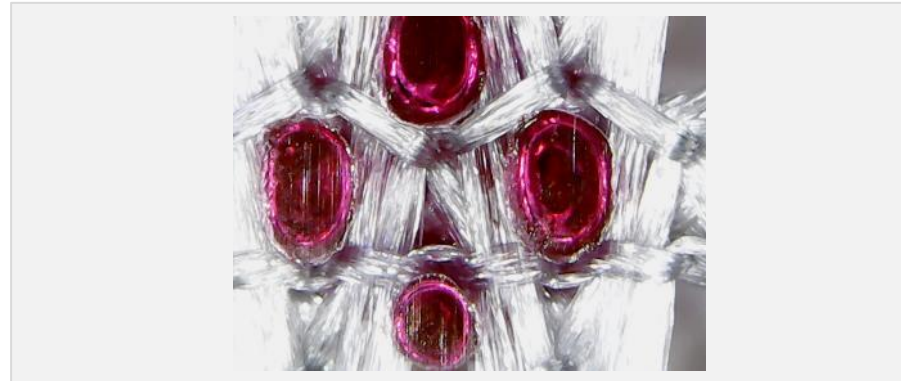
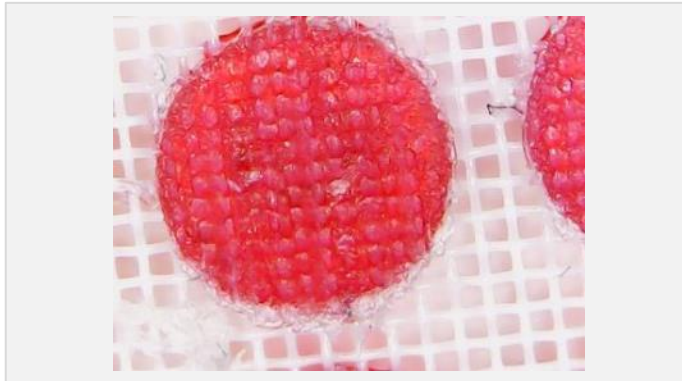
Deep yarn penetration



Fiber connection



Bottom-up view

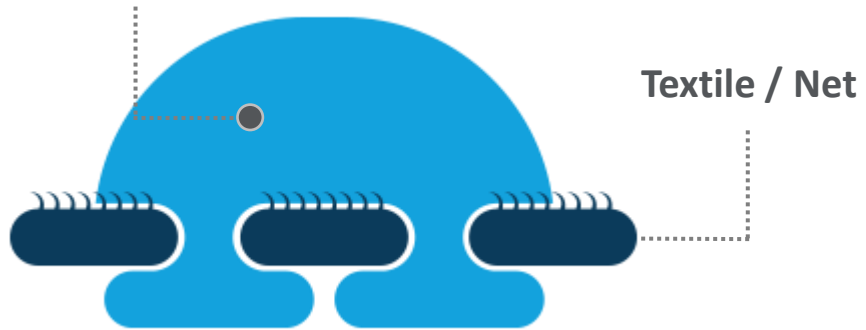


# 3DFashion™ Technology

Mechanical Adhesion Mechanism - Stratasys IP protected

## Double side connection example

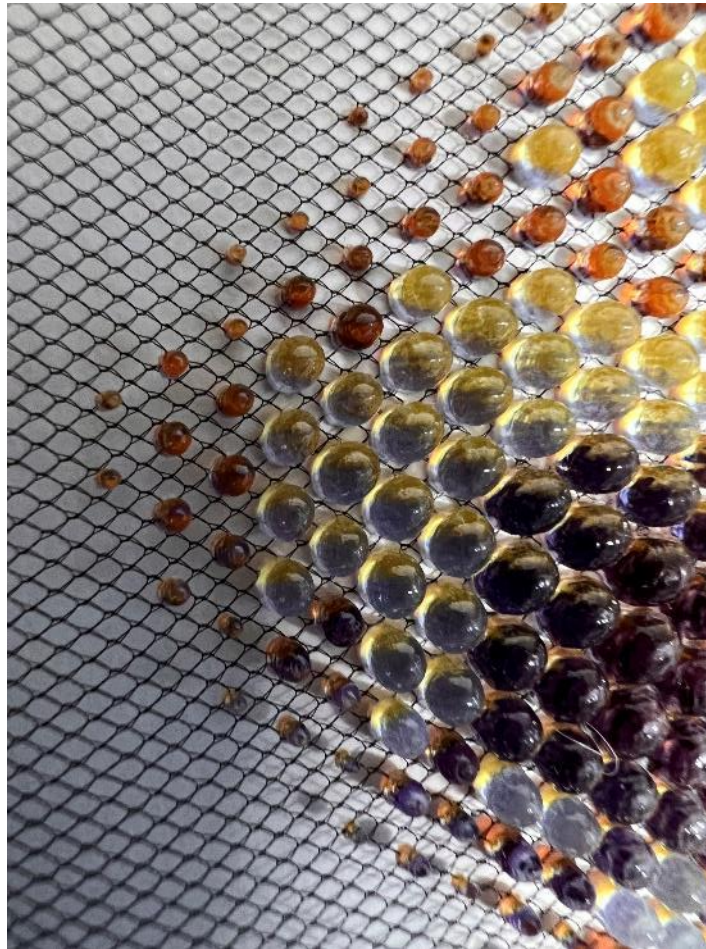
3D graphics



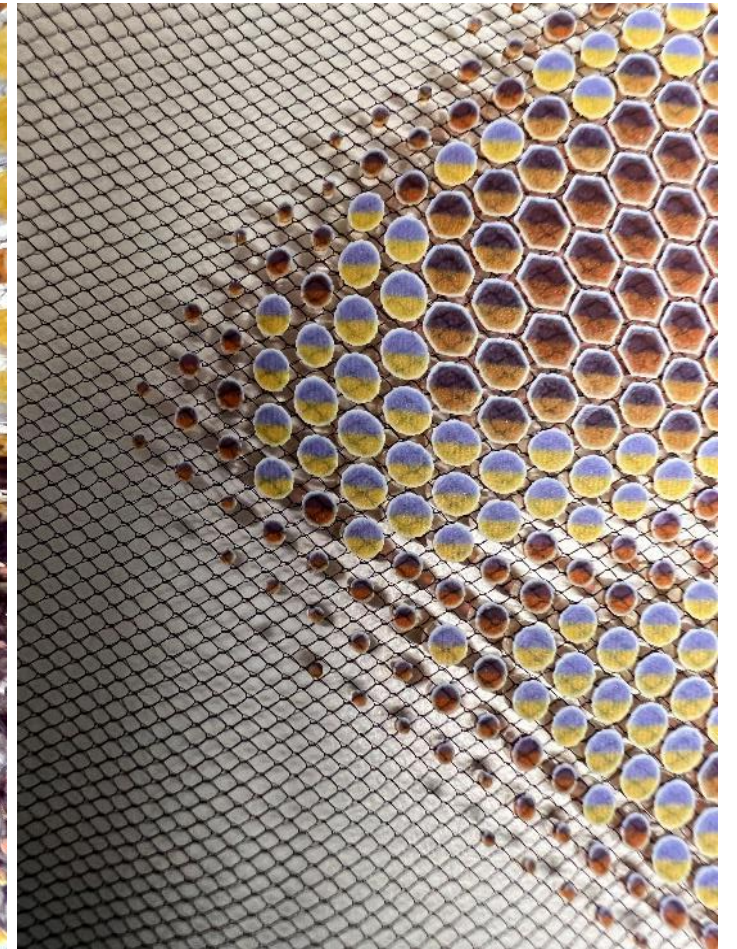
Side View



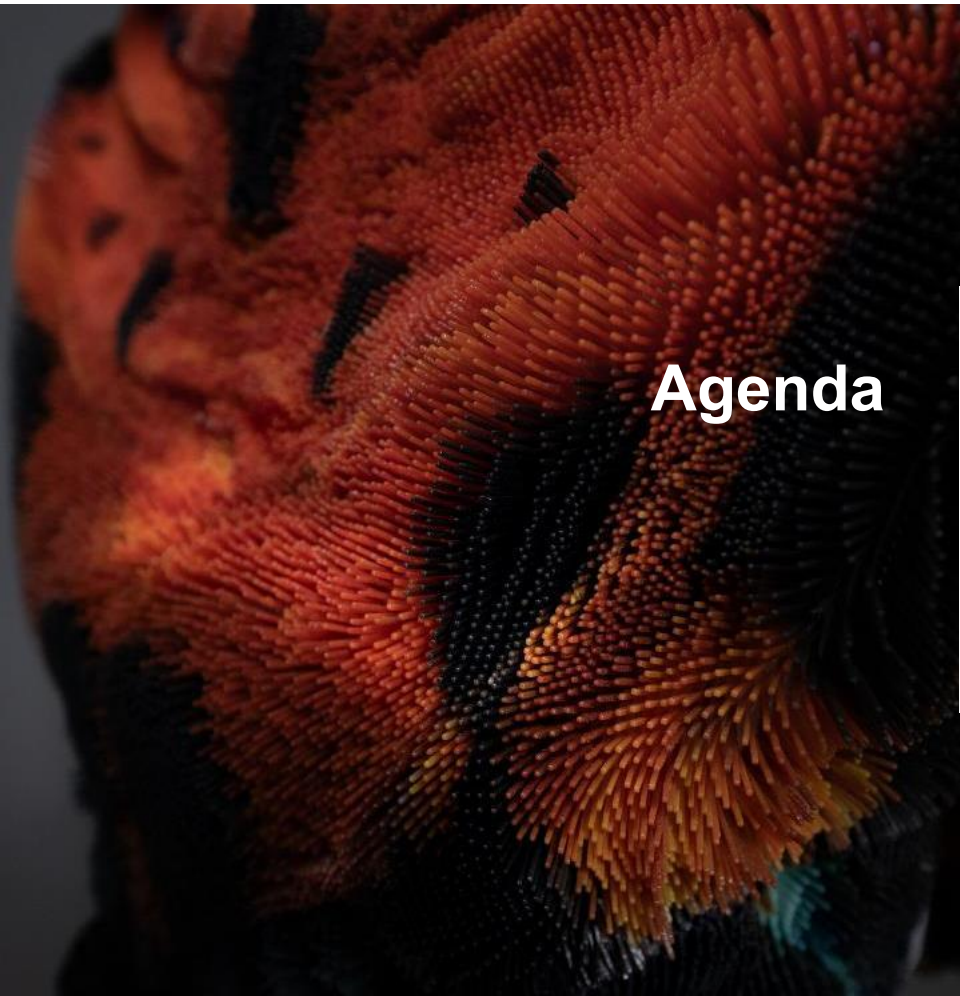
Top Side View



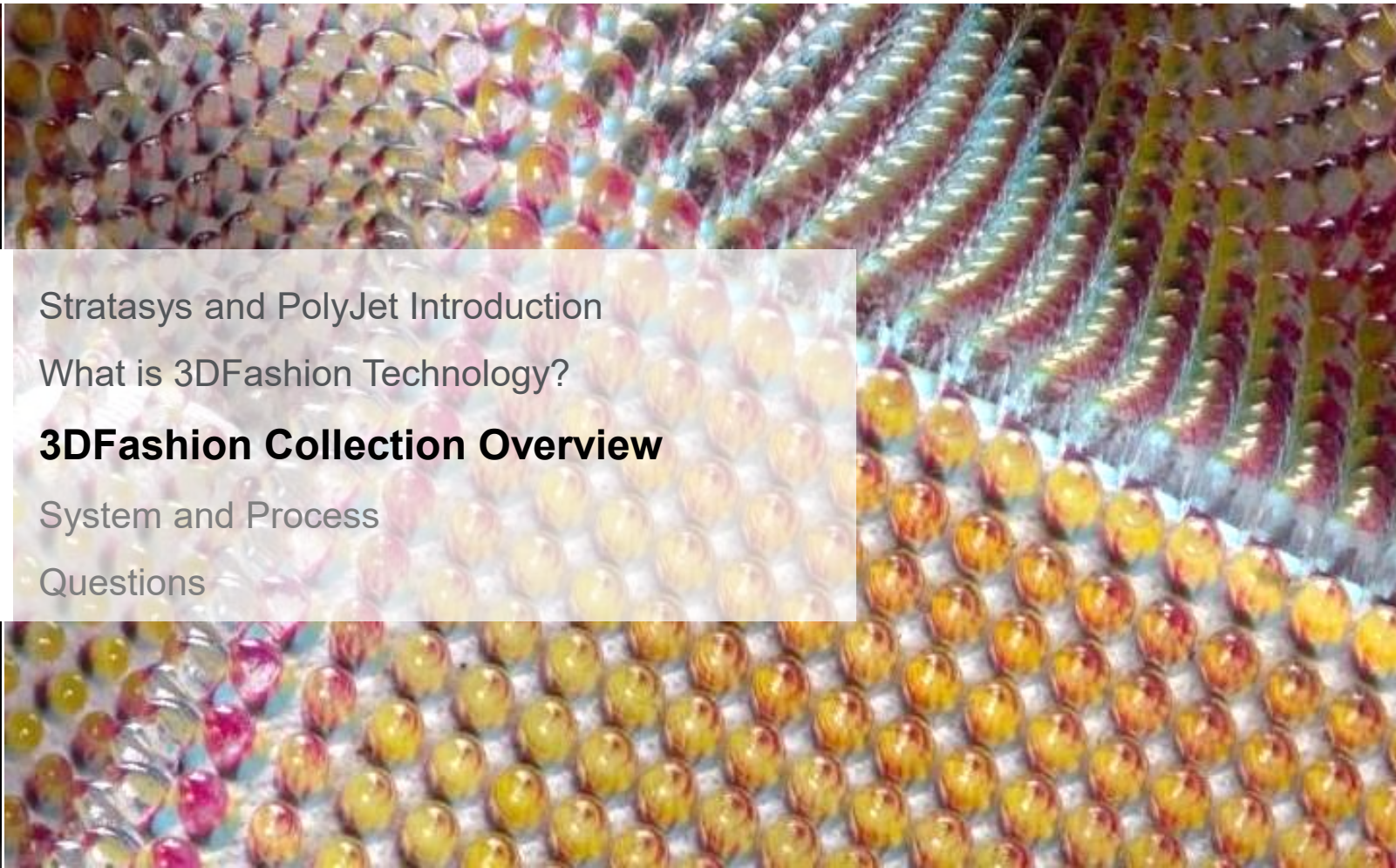
Bottom Side View



# Stratasys 3DFashion™



## Agenda



- Stratasys and PolyJet Introduction
- What is 3DFashion Technology?
- 3DFashion Collection Overview**
- System and Process
- Questions



Ludi Nature  
2018

Iris Van Herpen  
J850 TechStyle™ Printer  
Full-Color, Multi-Material



NO. 100

SETAE Jacket  
2019

Julia Koerner  
J850 TechStyle™ Printer  
Full-Color, Multi-Material

2019





**Greta Oto**  
**Dress**  
**2019**



**ThreeASFOUR**  
**Travis Fitch**  
J850 3DFashion Printer  
Full-color, Multi-Material

2019

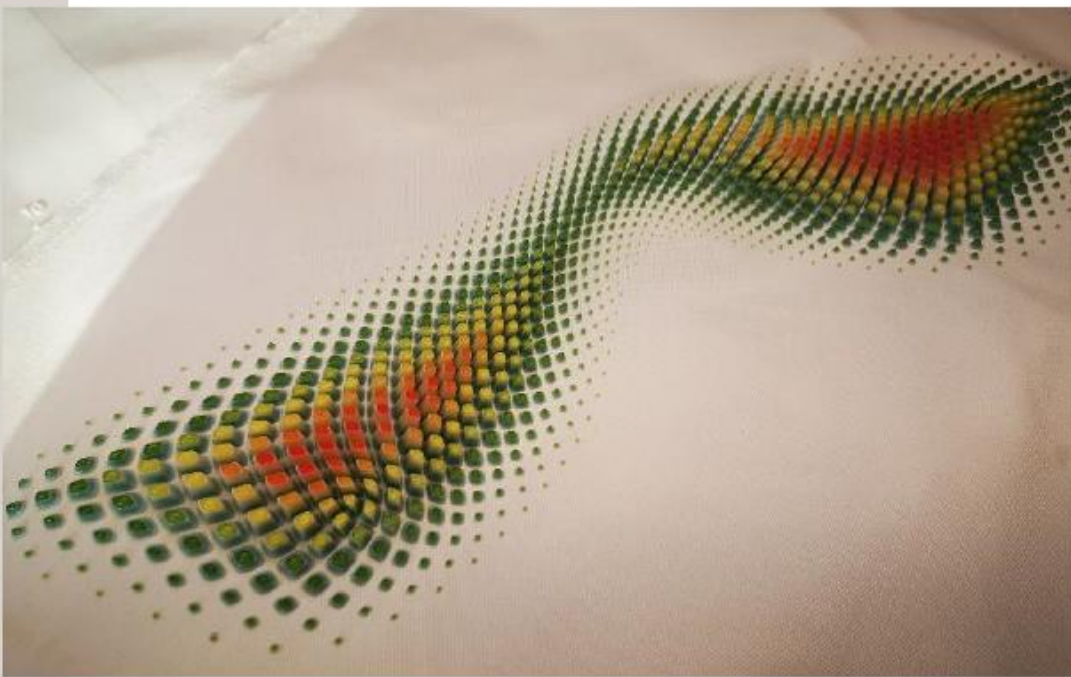


3D Prints onto denim  
2019



KAIMIN  
J850 TechStyle™ Printer  
Full-Color, Multi-Material





JASNA ROK LAB  
w/ TRAVIS FITCH  
OPERA ON BRAINWAVES



## Concept Car Design

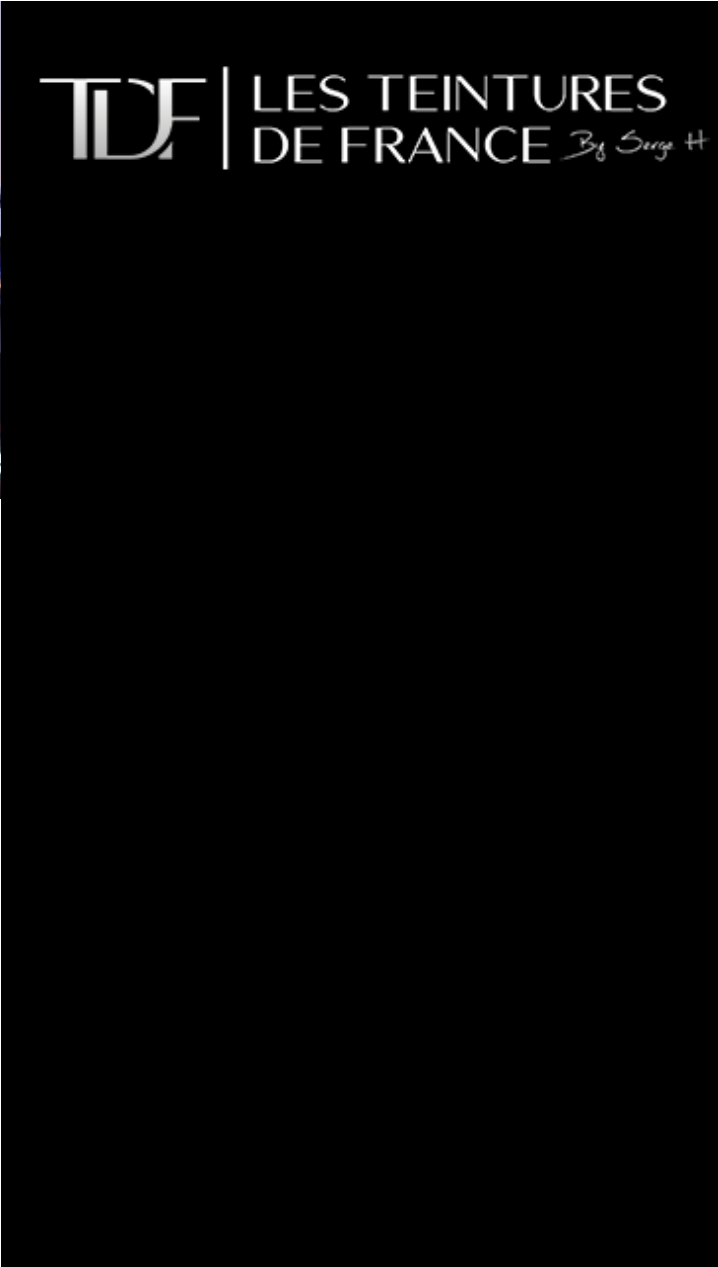
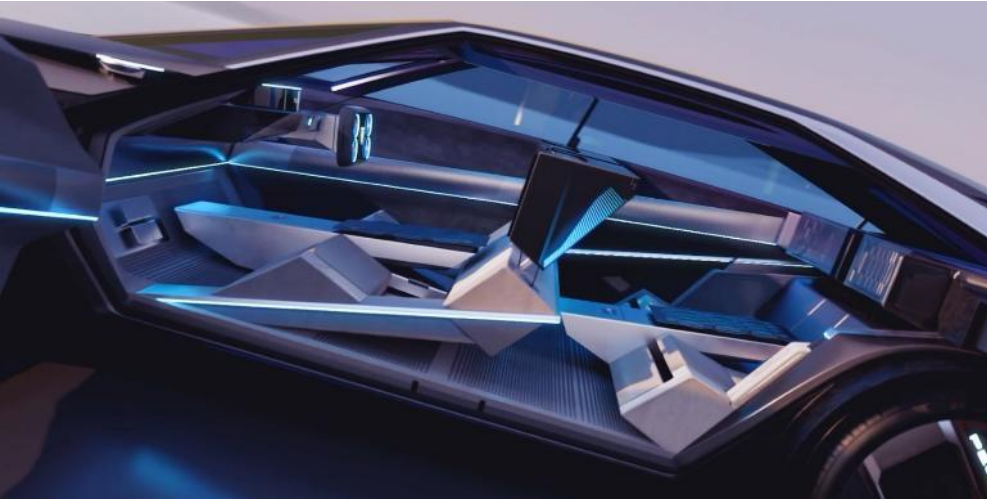


## Mercedes-Benz VISION EQXX

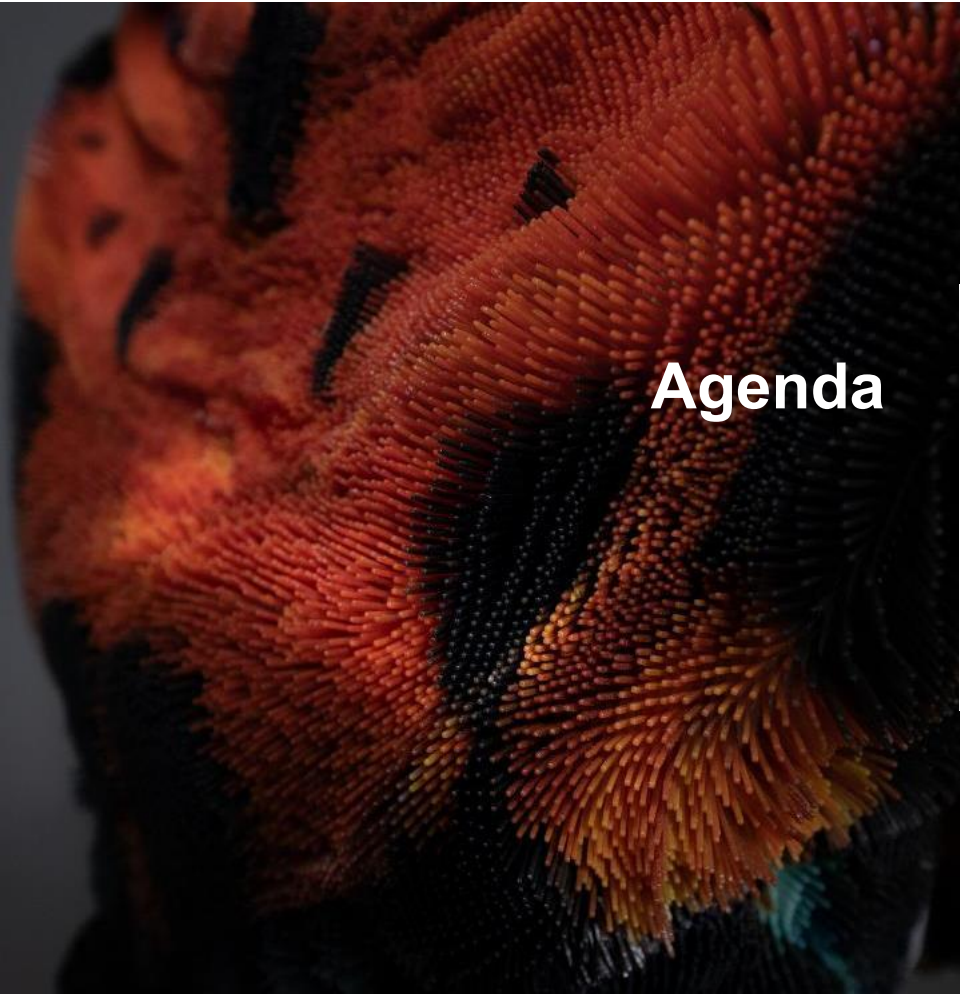
<https://media.mercedes-benz.com/article/add60971-970a-4014-a831-0d6175e11fab>

Source: Mercedes Benz

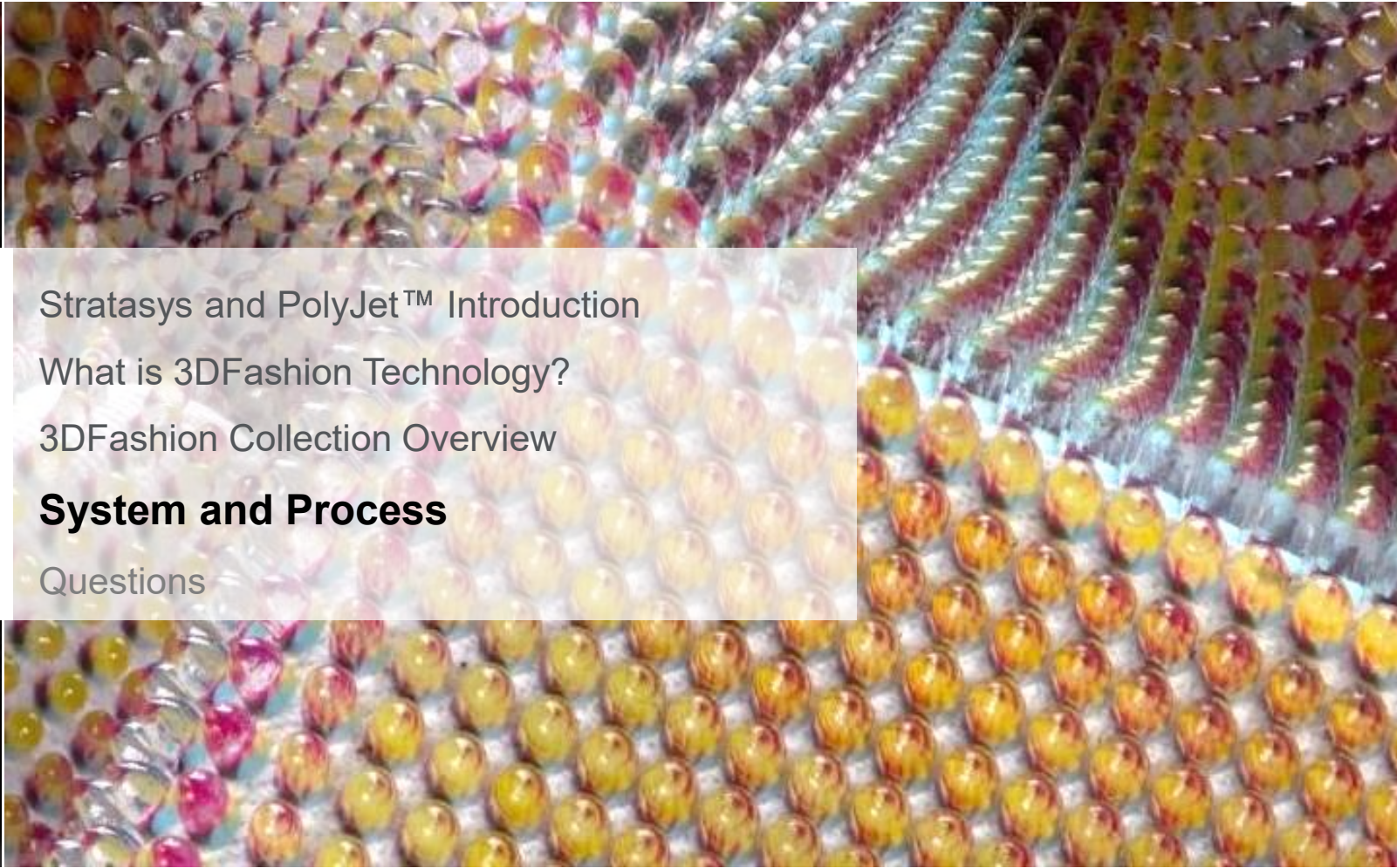
# Collaboration with Peugeot – Inception concept car



# Stratasys 3DFashion™



## Agenda

- 
- Stratasys and PolyJet™ Introduction
  - What is 3DFashion Technology?
  - 3DFashion Collection Overview
  - System and Process**
  - Questions

# Product Details **J850 TechStyle**

## Size

- Machine: W:140cm (55.1in), H:126cm (49.6in), D:110cm (43.3in)
- Material Cabinet: W: 67cm (26.4in), H:117cm (46.1in), D:64cm (25.2in)

## Weight

- Machine: 430 Kg (948lb);
- Material cabinet: 152 Kg (335lb)

## Power requirements

- 100–120 VAC, 50–60 Hz, 13.5 A , 1 phase
- 220–240 VAC, 50–60 Hz, 7 A , 1 phase

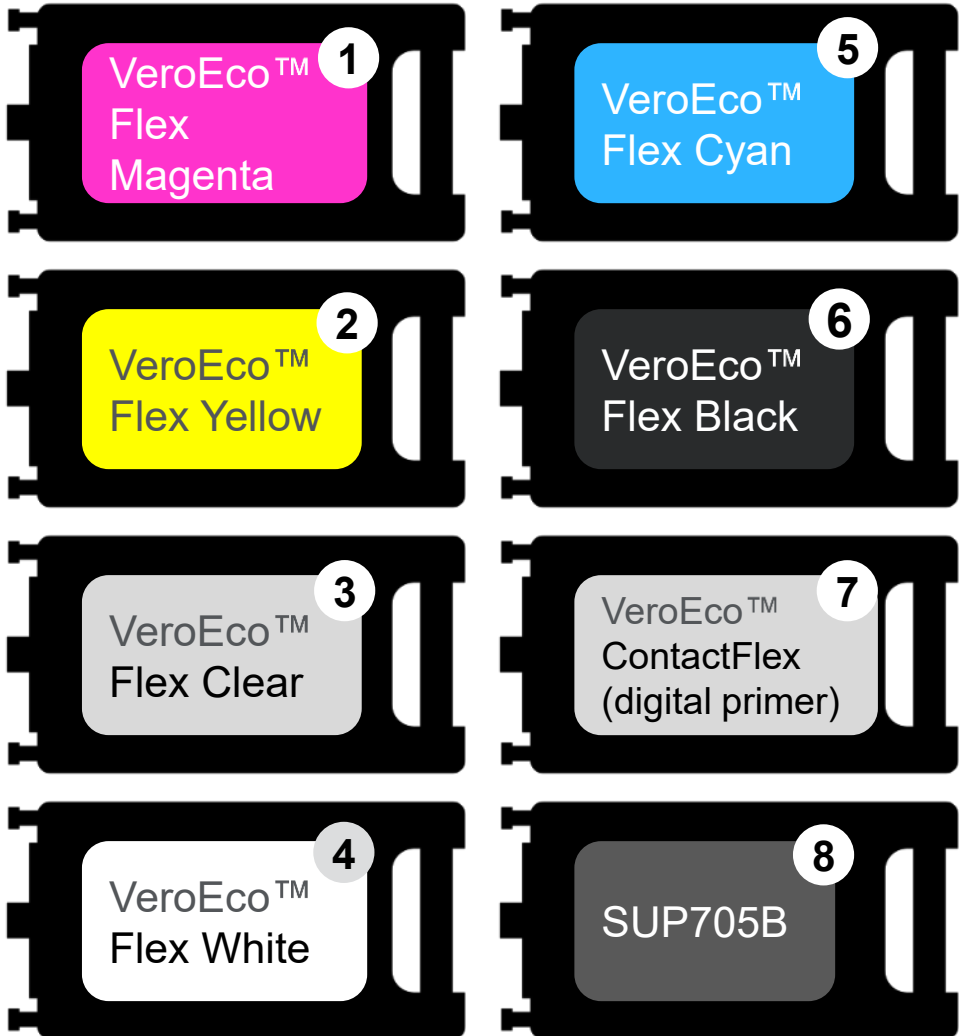
## Regulatory Compliance

- CE, FCC, EAC

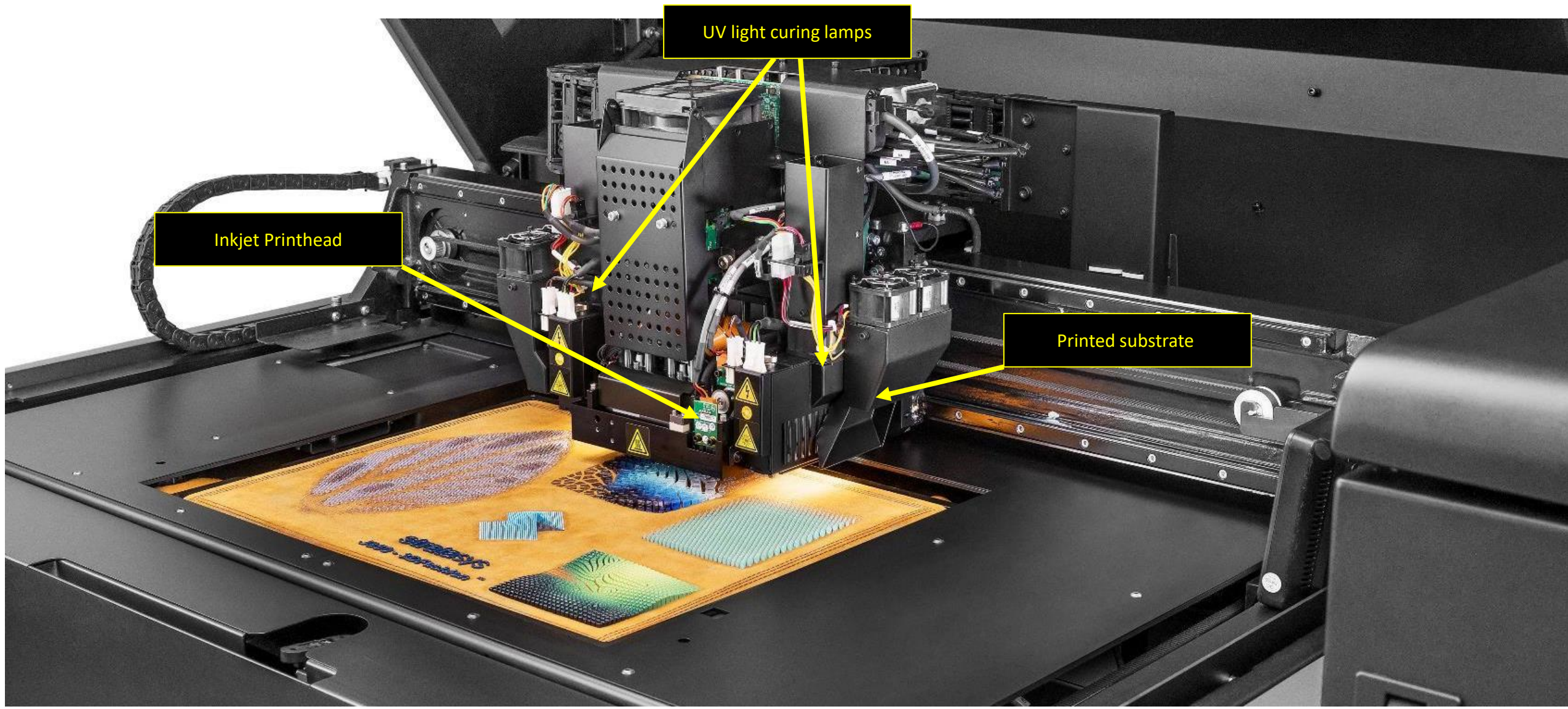


# Materials Configuration

## Semi-Flexible, Full Color / Transparent



# PolyJet™ Technology Inkjet Printing

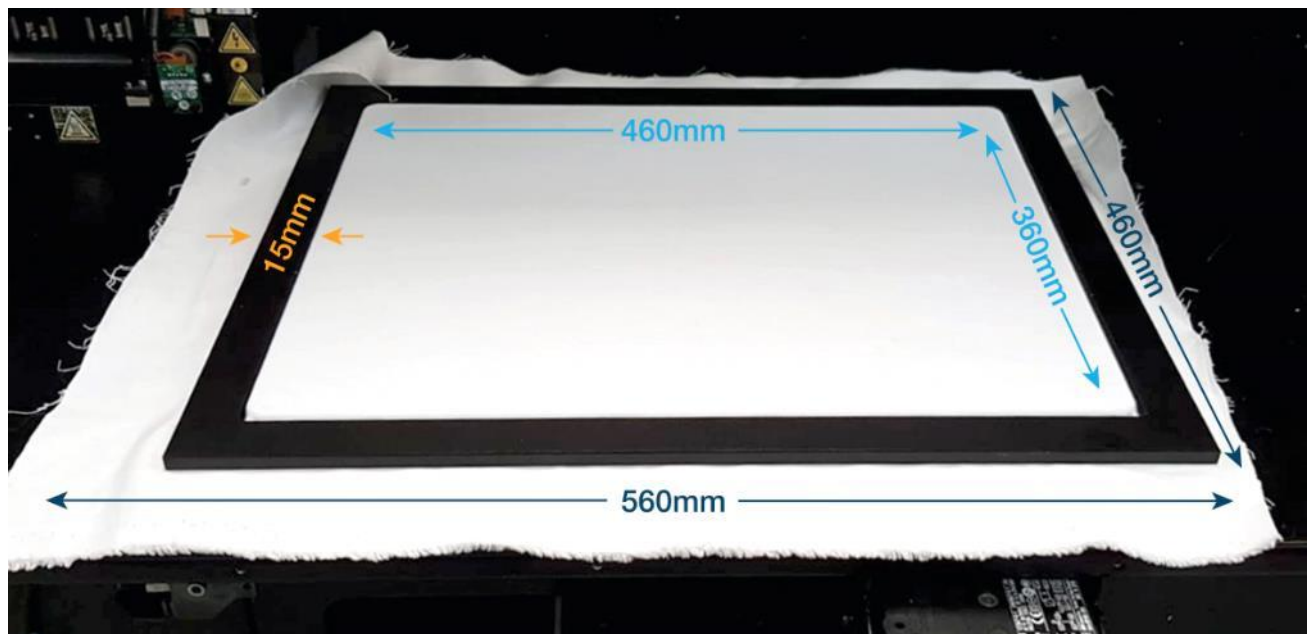




# J850 TechStyle Workflow

- Fabric loading
- Tray insertion
- Printing
- Tray removal

# J850 TechStyle Mounting Tray



The mounting tray and frame requires an excess material on each side in order allow proper mounting and stretching.

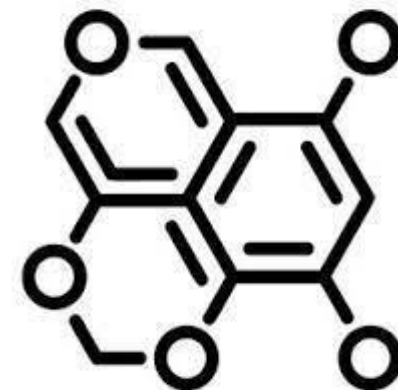
- Fabric size (recommended)
- Minimum: X – 560 [mm] Y – 460 [mm]
- Maximum: X – 2,000 [mm] Y – 2,000 [mm]
- Fabric Thickness using magnetic frame: 0.1-3.0 [mm]
- Printing area: X – 460 [mm] Y – 360 [mm]

# 3DFashion Innovative Application for 3D printing

What's behind it?

Three main parameters to manage the performance:

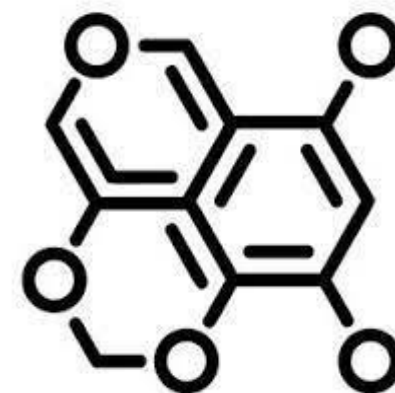
- Textile
- Polymerization control
- Design



# 3DFashion Innovative Application for 3D printing

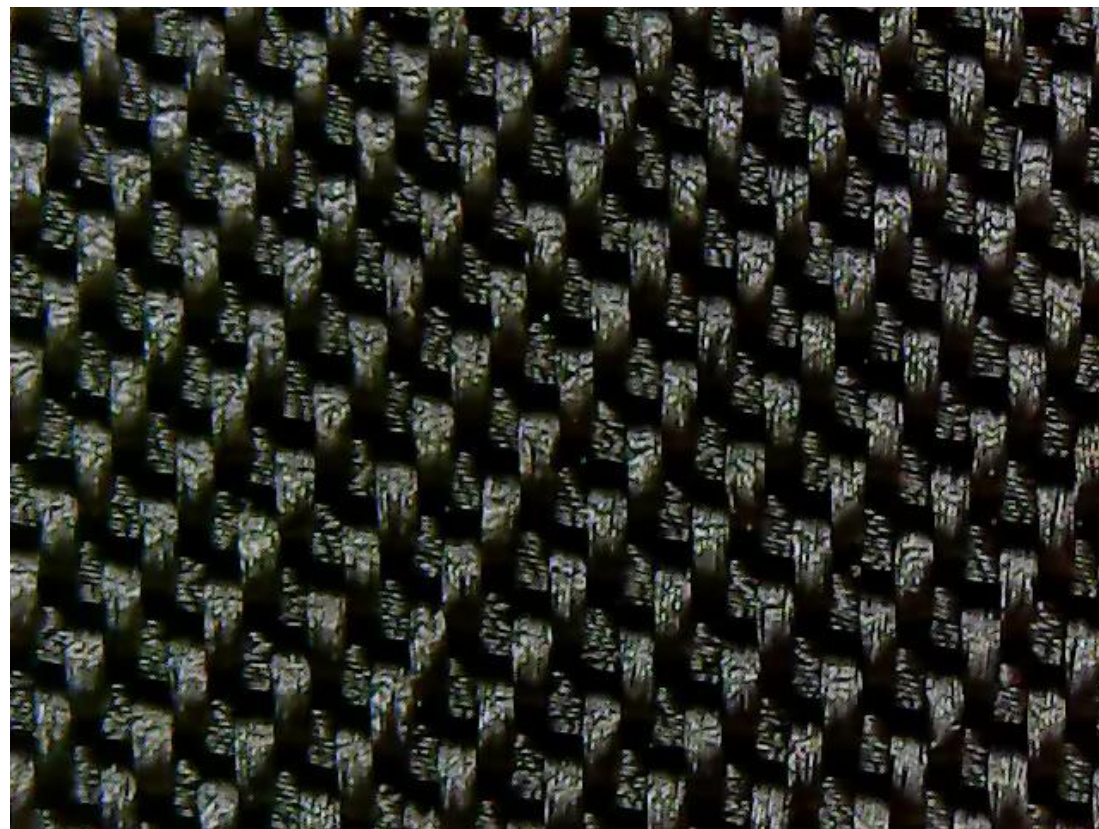
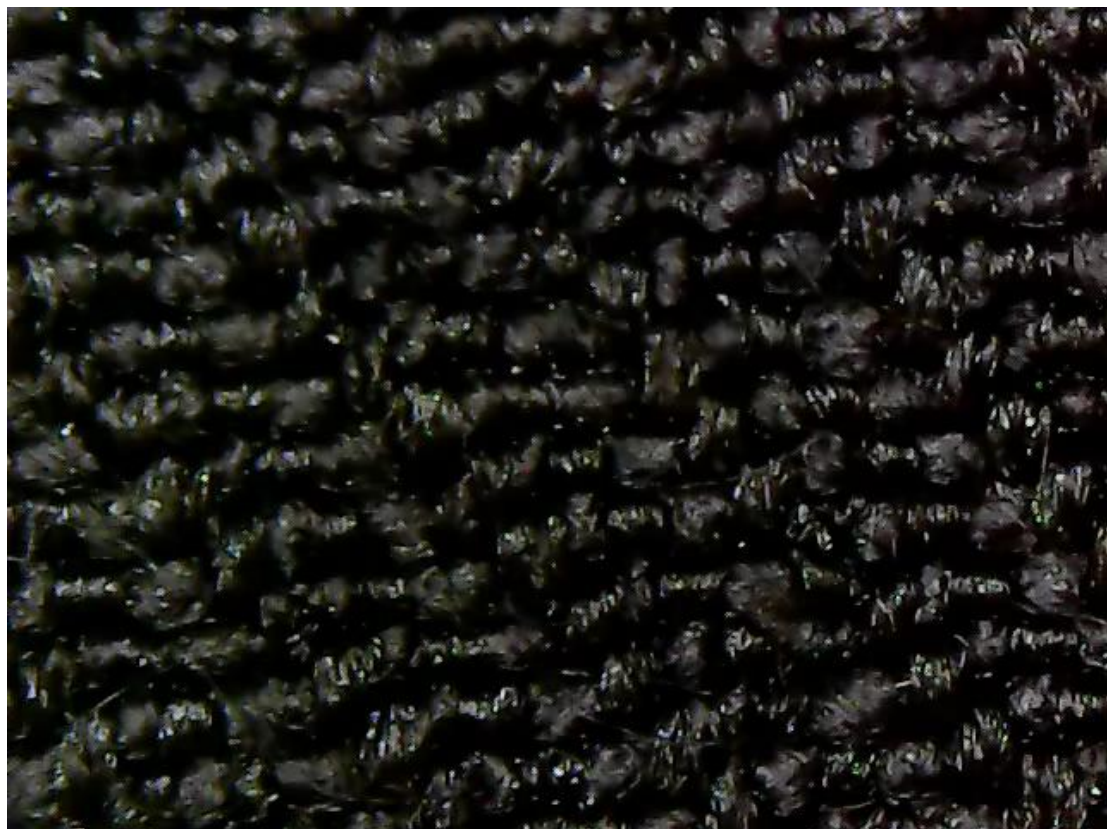
What's behind it?

## Textile



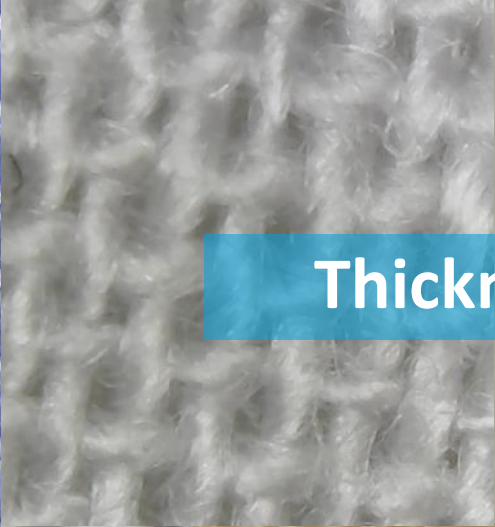
# Fabric type and influence on process

It's all about absorption...

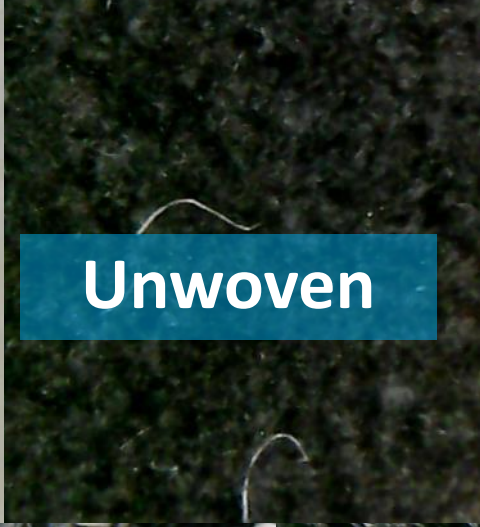




Density



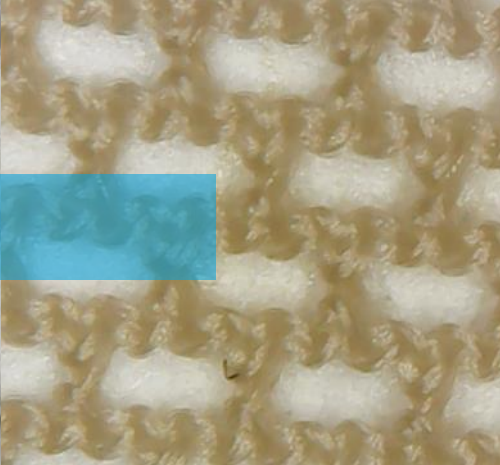
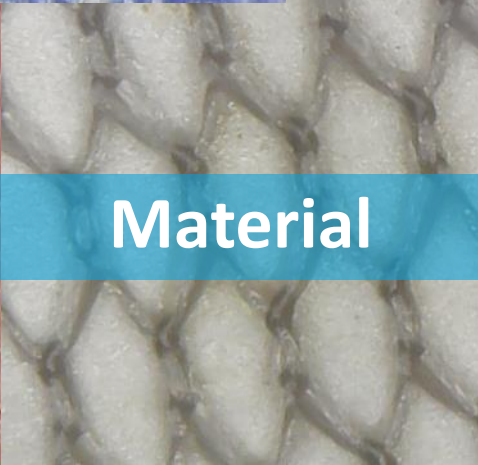
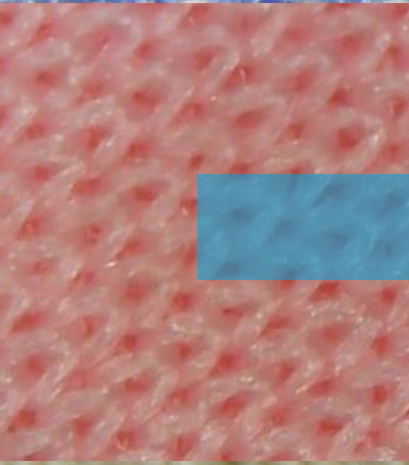
Thickness



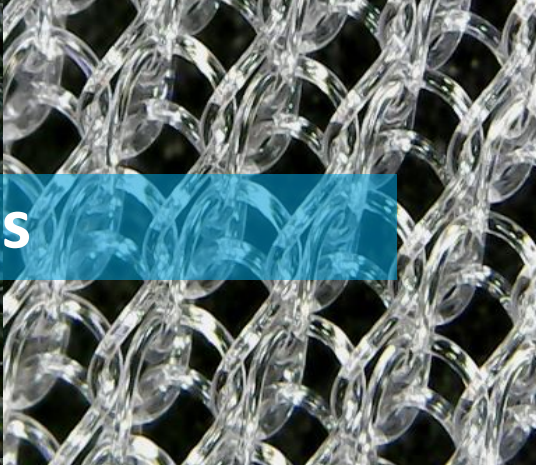
Unwoven



Woven  
Parten



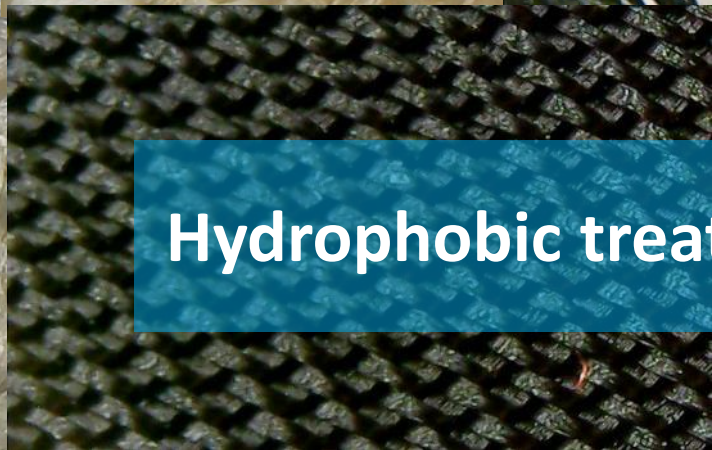
Material



Nets



Surface texture



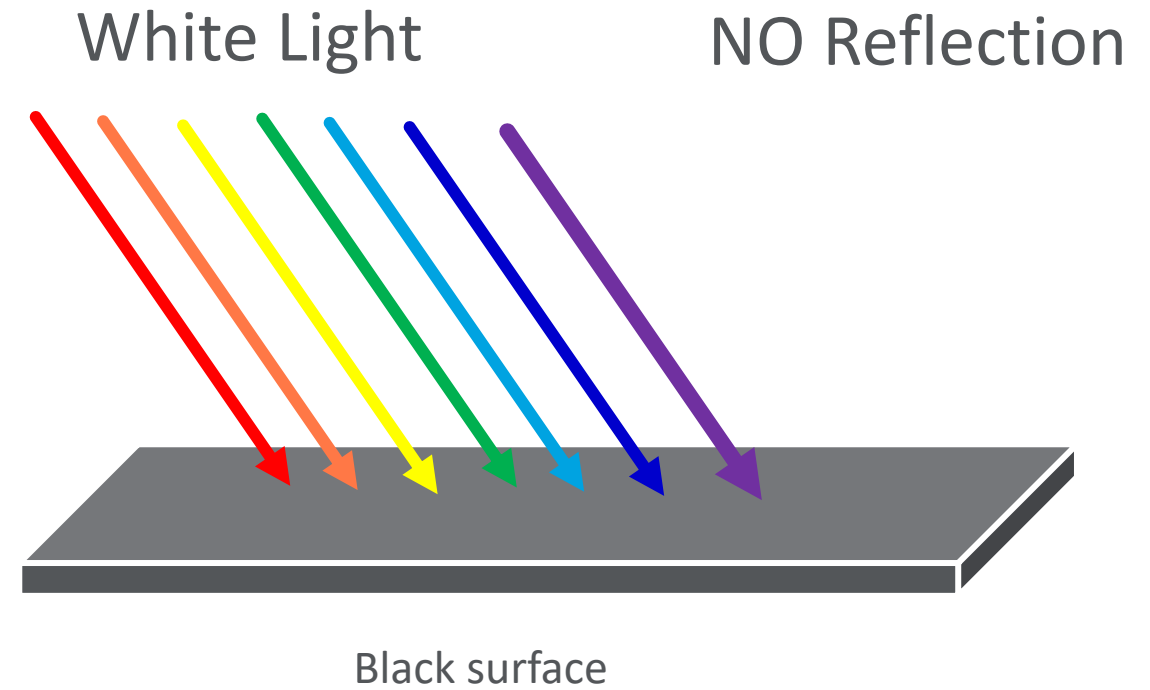
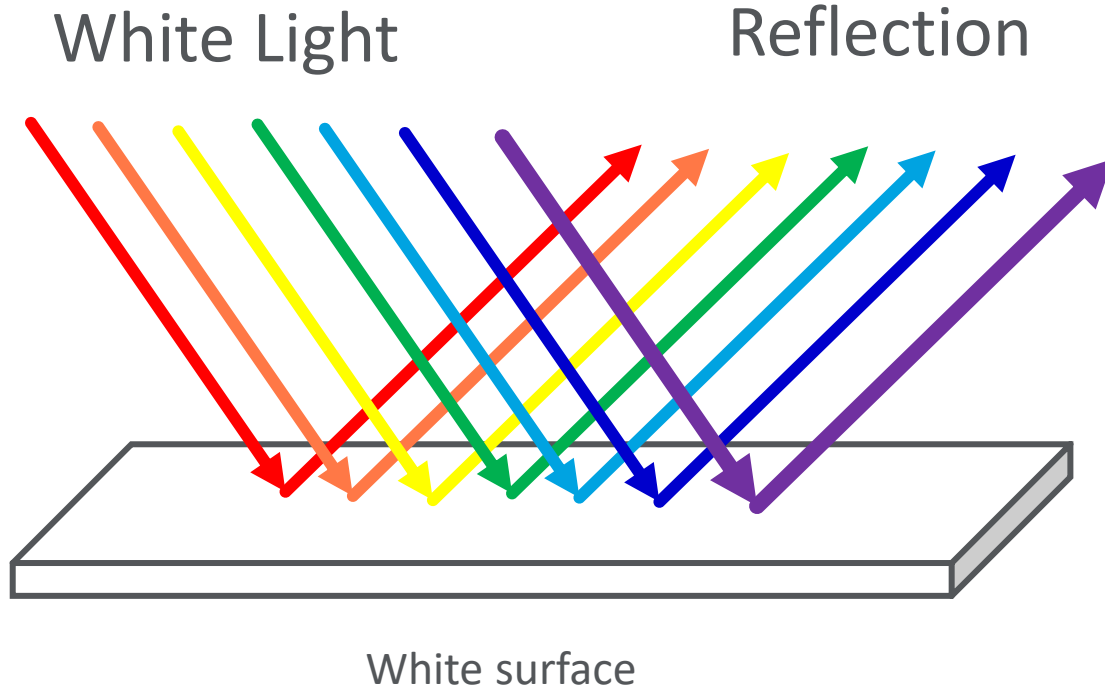
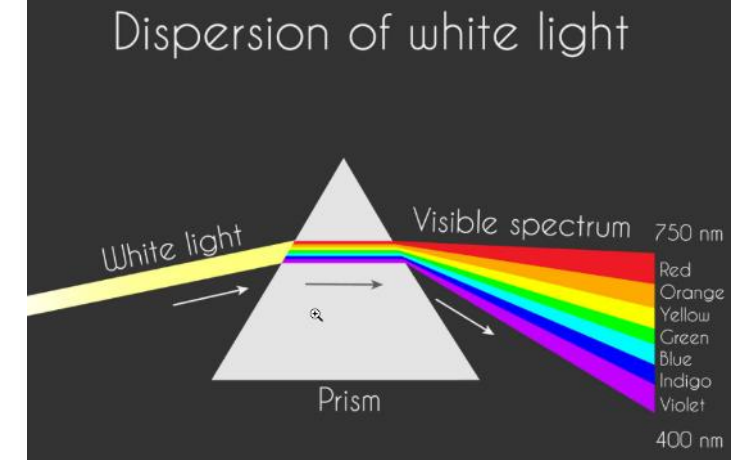
Hydrophobic treated



Material  
combinations

# Fabric type and influence on process

Fabric's color influence the result – UV absorbtion



# Fabric type and influence on process

## Production process and chemical used

- Color Inks
- Softener
- Washing products
- Waterproof treatment

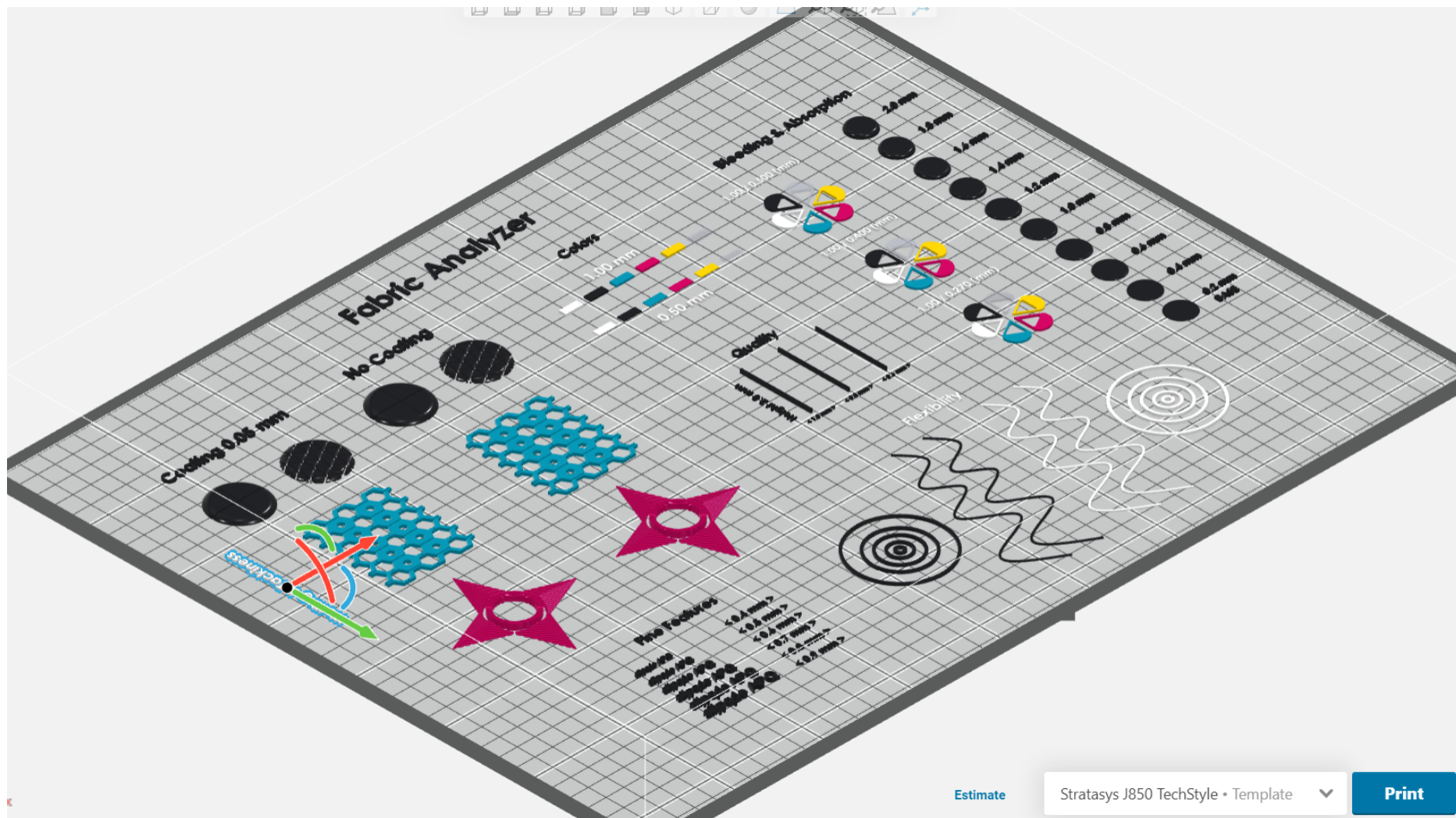
And any other process/chemical...

Will also influence the  
adhesion of the resin to the  
fabric...



# Fabric test print

Example: Fabric Analyser



# Fabric test print

## Absorption and high quality test

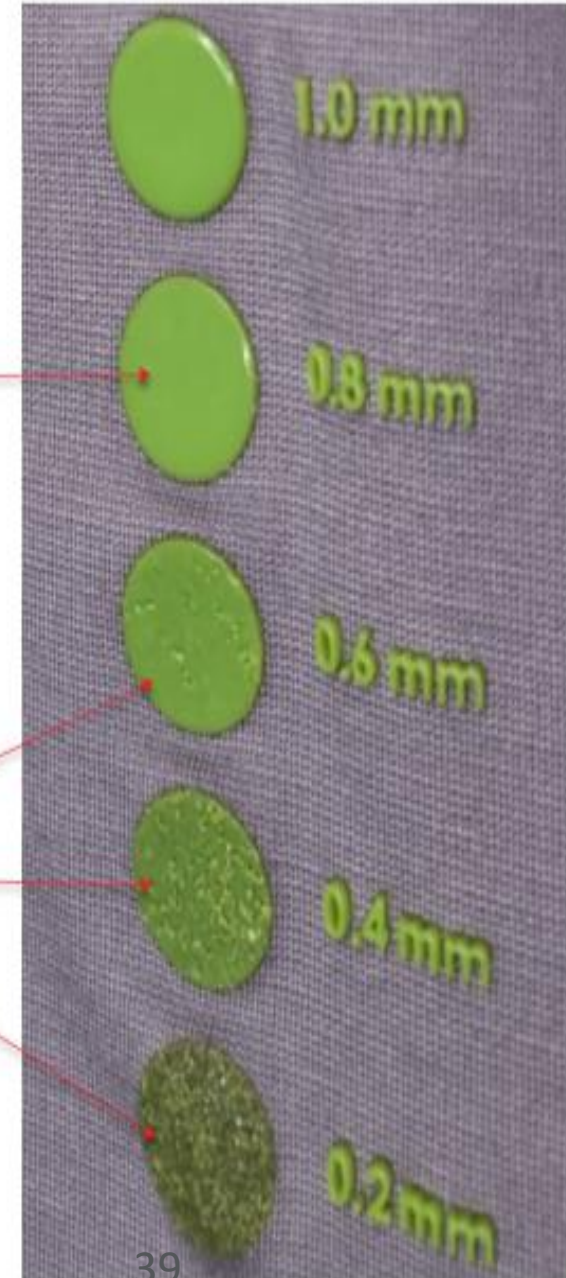
The Absorption test shows the following:

- How print quality is affected by the penetration of the print into the fabric.
- How to compensate for the absorption. Prints with different heights are printed on the fabric.

The print with the lowest height and optimum print quality is used to estimate the height compensation to apply to prevent the issue in your prints. You can adjust the design or the adhesion layer thickness to ensure that the prints are greater than (or equal to) the lowest height with optimum quality

Minimum height print  
with optimum quality

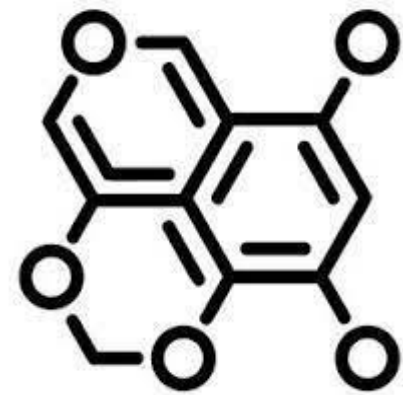
Poor quality prints



# 3DFashion Innovative Application for 3D printing

What's behind it?

## Polymerization control



# Fabric type and influence on process

## Examples of fabrics

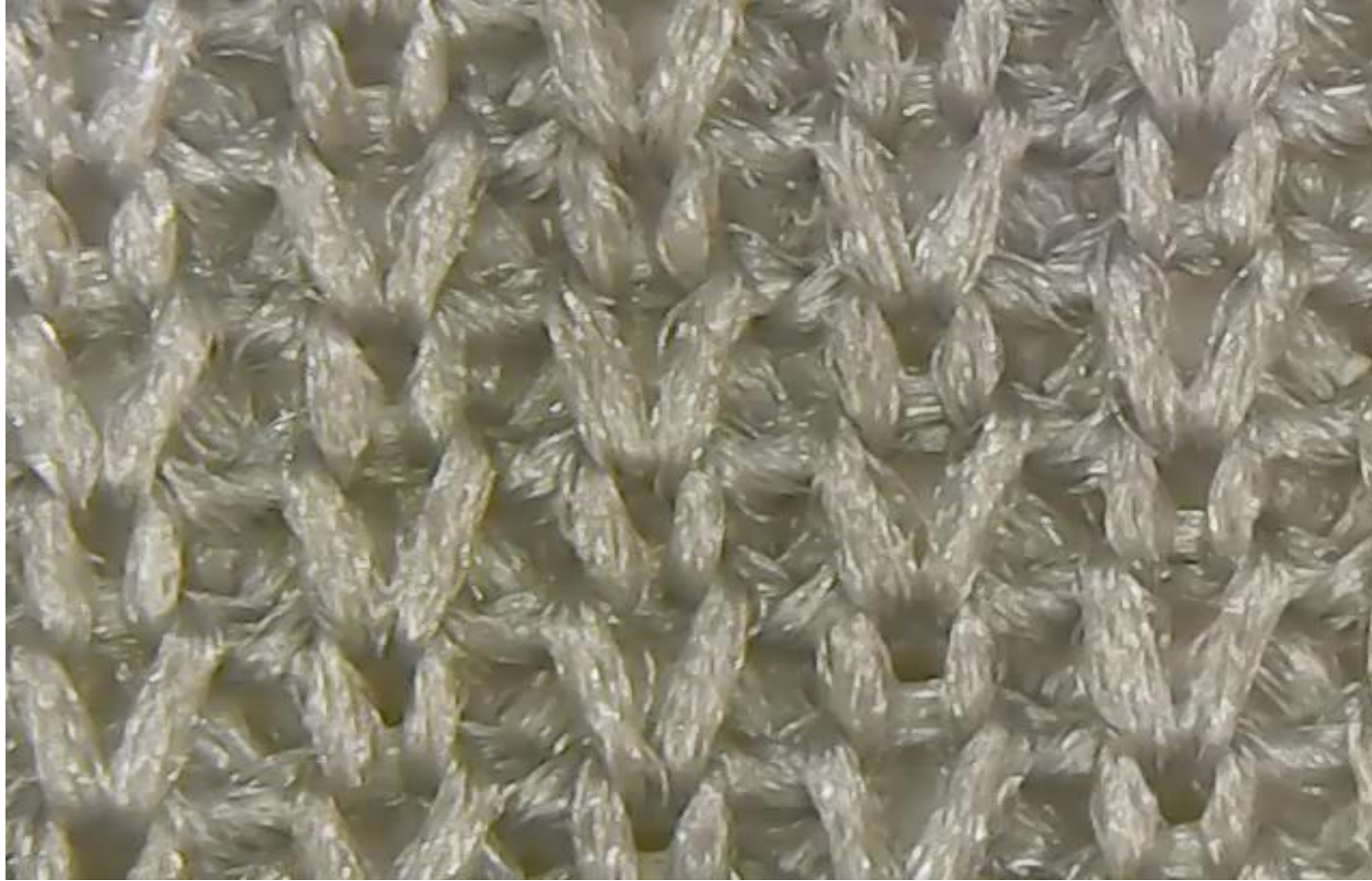


Good absorption Level – could be printed General LED Recipe



# Fabric type and influence on process

## Examples of fabrics



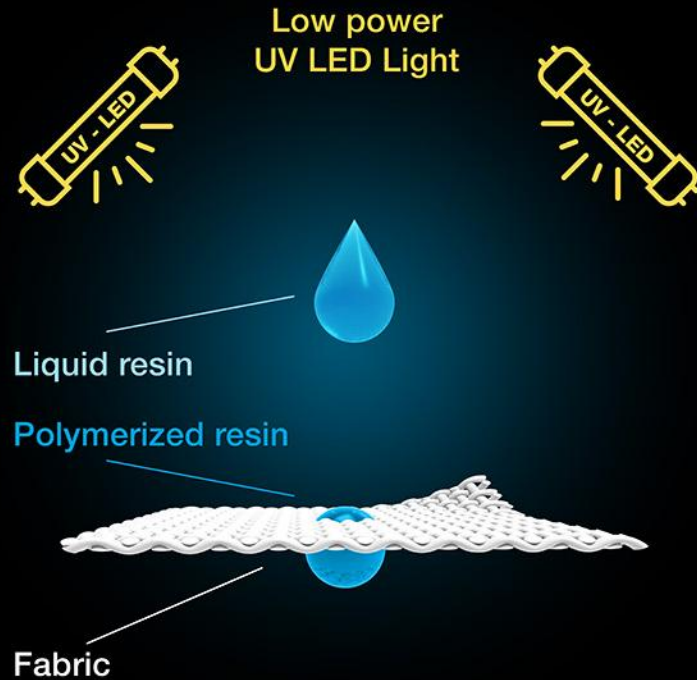
Very Fast absorption – Absorbent LED Recipe required



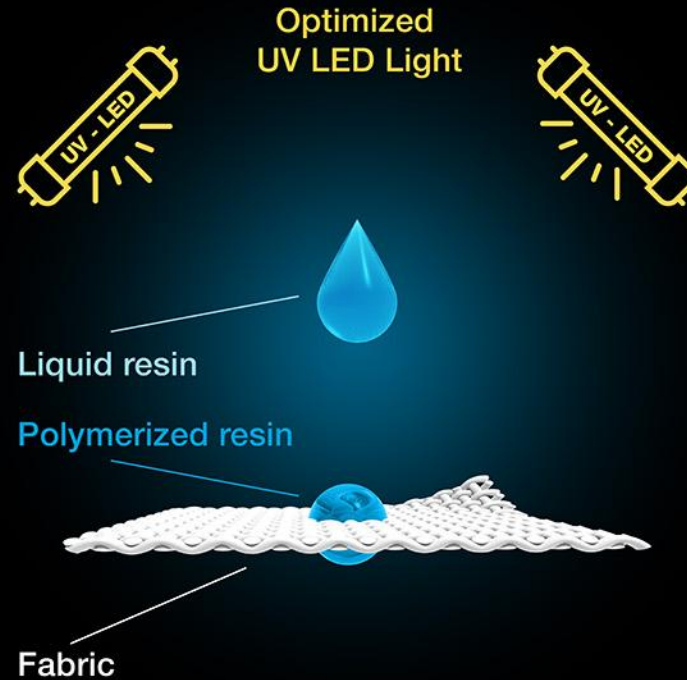
# 3DFashion™ Technology

## J850 Techstyle™ LED – Adhesion optimization

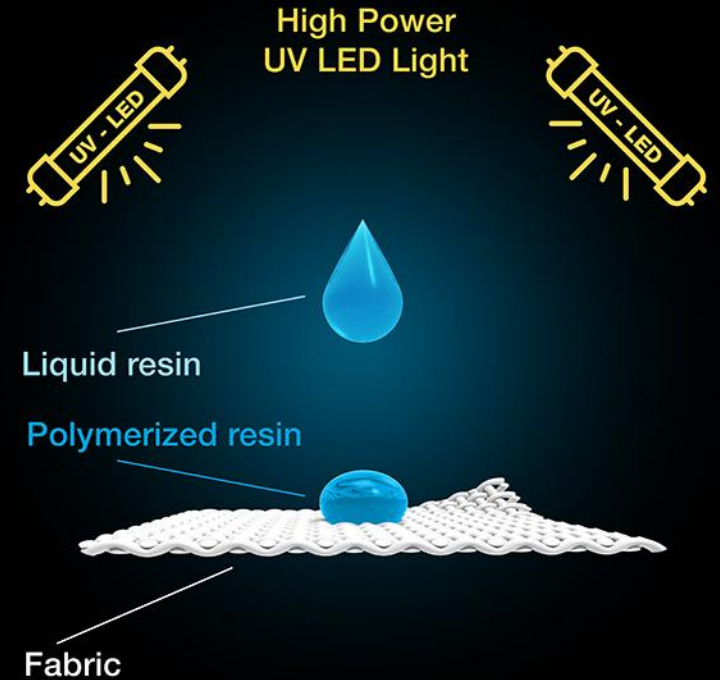
### Underexposure of UV light



### Parameter Optimized



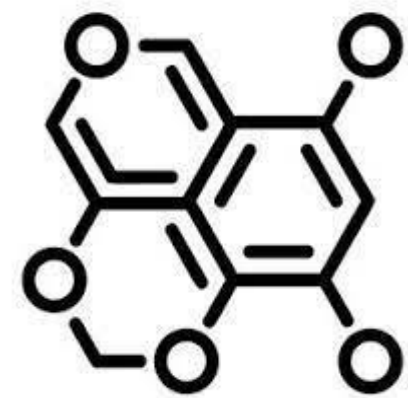
### Overexposure of UV light



# 3DFashion Innovative Application for 3D printing

What's behind it?

## Design



**What do you think is the reason we keep those “segmented” style of construction?**

**Keep mobility of the fabric**

# The printer can print models till 50 mm height.

That doesn't mean that everything needs to be this high or big?

Remember, the higher or bigger the model is:

- The more time it will require to produce.
- The more resin you will need to build it, meaning the model will have a higher cost.
- The heavier the final product will be.

# Design SW options

## Drawing SW



## Design SW



## Rendering and Animations SW



CINEMA 4D

## Image creation and Edition

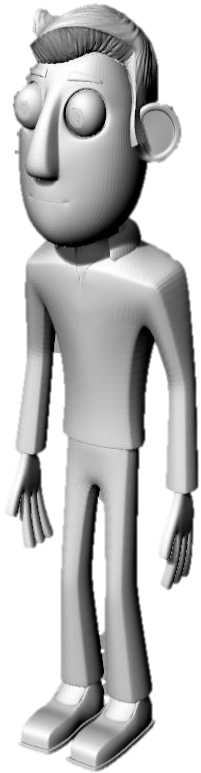


# Output File Format

Drawing SW



.STL



Drawing SW

+ Design SW



.STL | .VRML  
OBJ



Drawing SW

+ Rendering and  
Animations SW



.STL | .VRML  
OBJ | 3MF

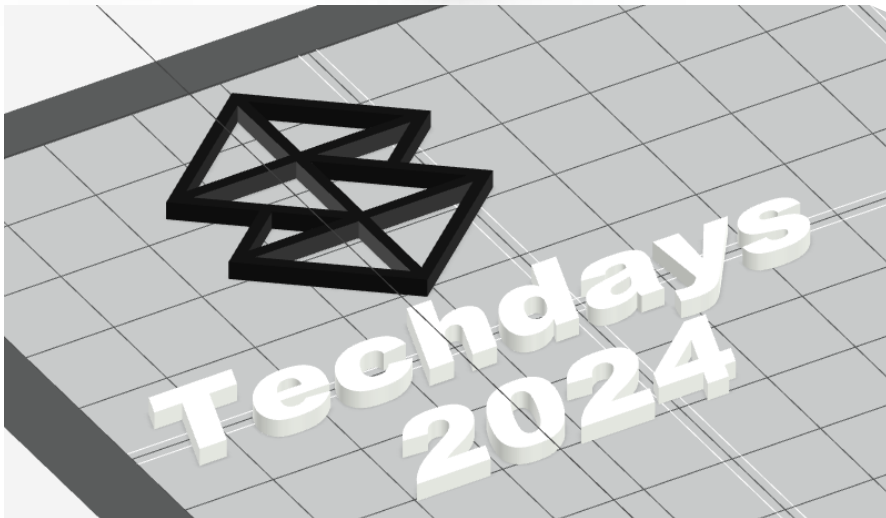


There are two ways we can follow...

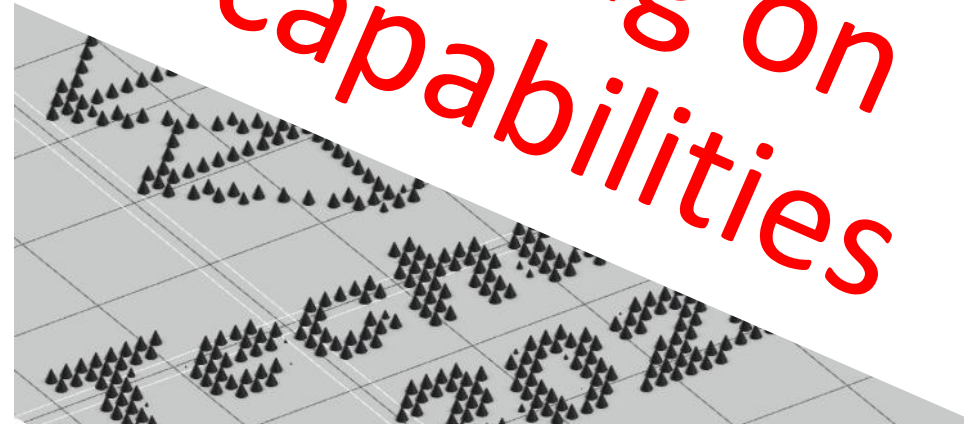
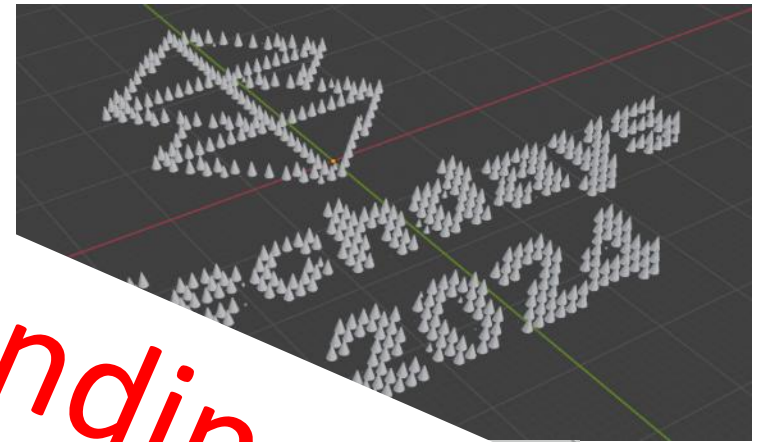
Division

Distribution of  
base element

More possibilities depending on  
designer and software capabilities



Very easy with Rhino or Illustrator depending on the source file

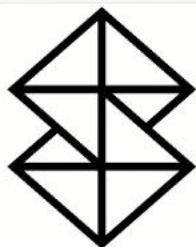


Relatively easy with Rhino or Blender

**Let's do an example of  
the solid letters...**

# Rhino...

## Quick software demonstration...



***Techdays***  
***2024***



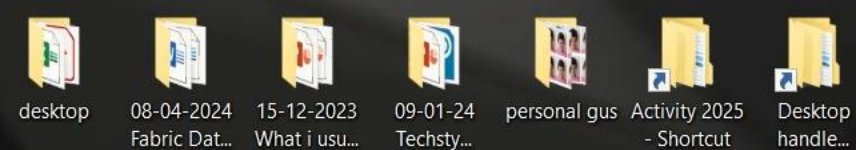
.jpg

## You would say...

“I want to replicate this into something printed and I don’t have a vector...”

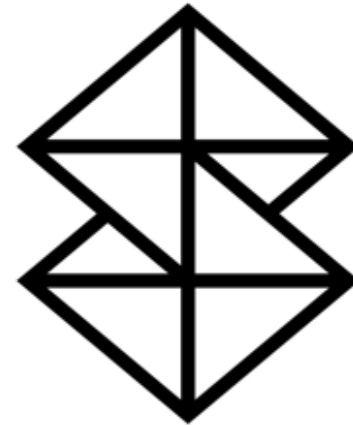
## You will need...

- Good quality image
- Photoshop or any other software that allows you to modify the image
- A software that allows you to create a vector from the image



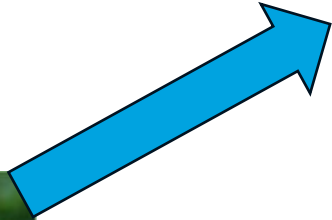
# What about dividing it on little columns?

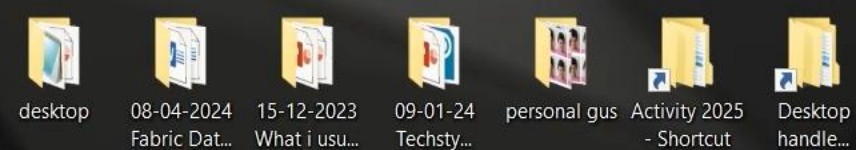
Easy... lets use our 2D23D software...



# 2D<sup>2</sup> 3D

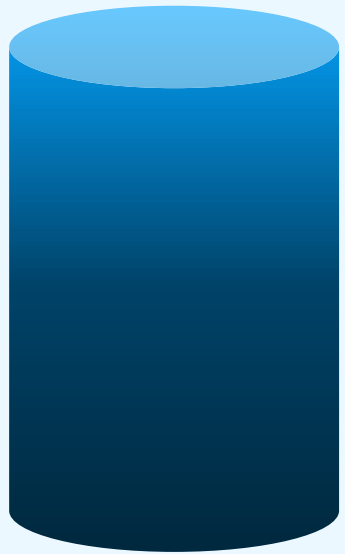
It is a tool that can help designers to create 3D models from image files to be printed on fabrics with TechStyle printer.





# Design Considerations

## Fabric impacting design



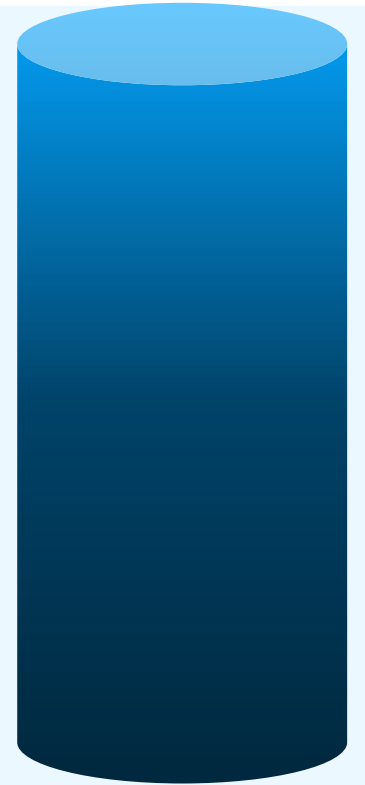
Desired design



Thicken the model  
according to fabric's pattern



Raise the model height  
according to fabric's  
surface

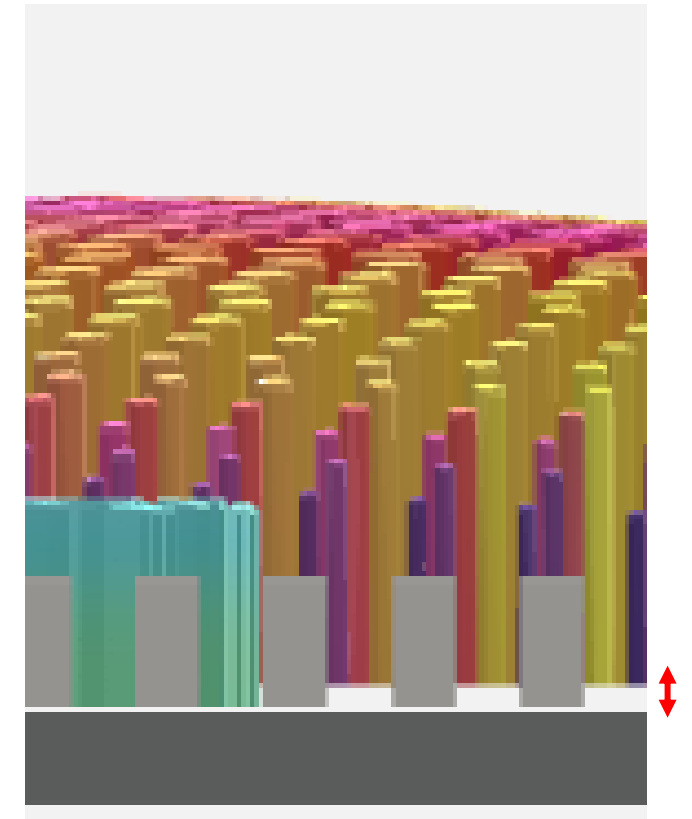
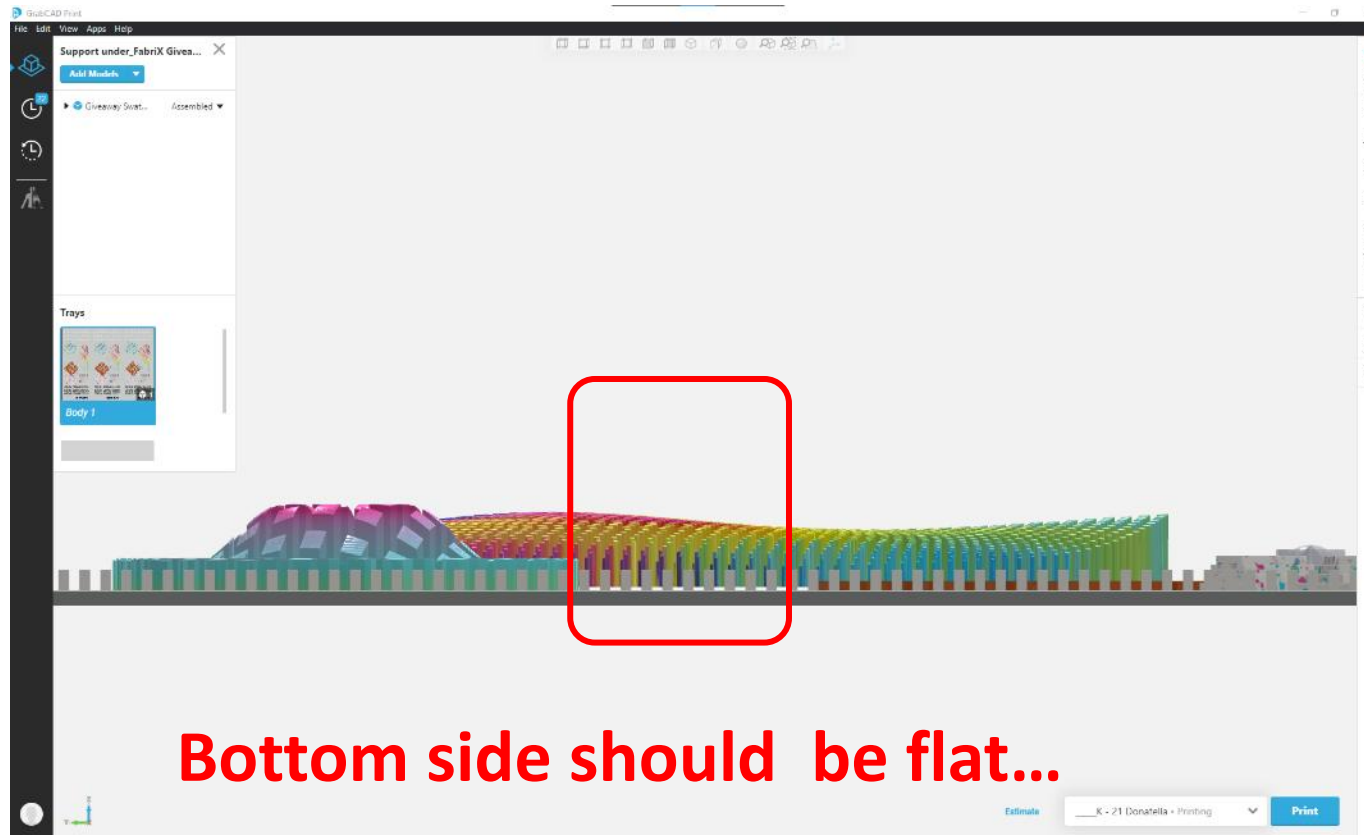


Raise more if the fabrics  
absorbing material

# Design Considerations

All bodies should be aligned and flat at the base

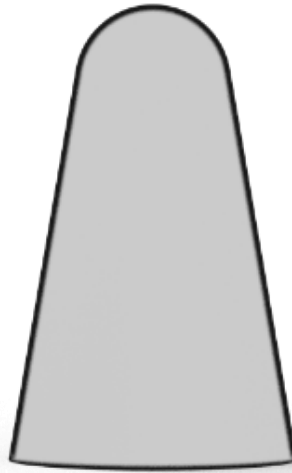
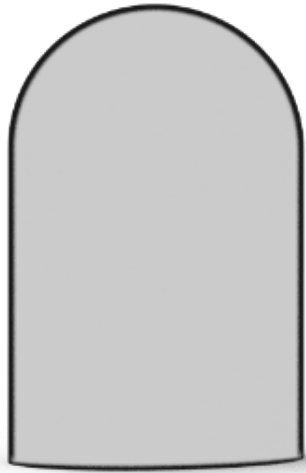
Certain parts of the assembly might not be aligned and will “float” in the air.  
In this case, the printer will fill the gap with support material and the parts won’t bond to the fabric  
Adding an Adhesion Layer won’t work because the support will be printed on top of it.



# Design Considerations

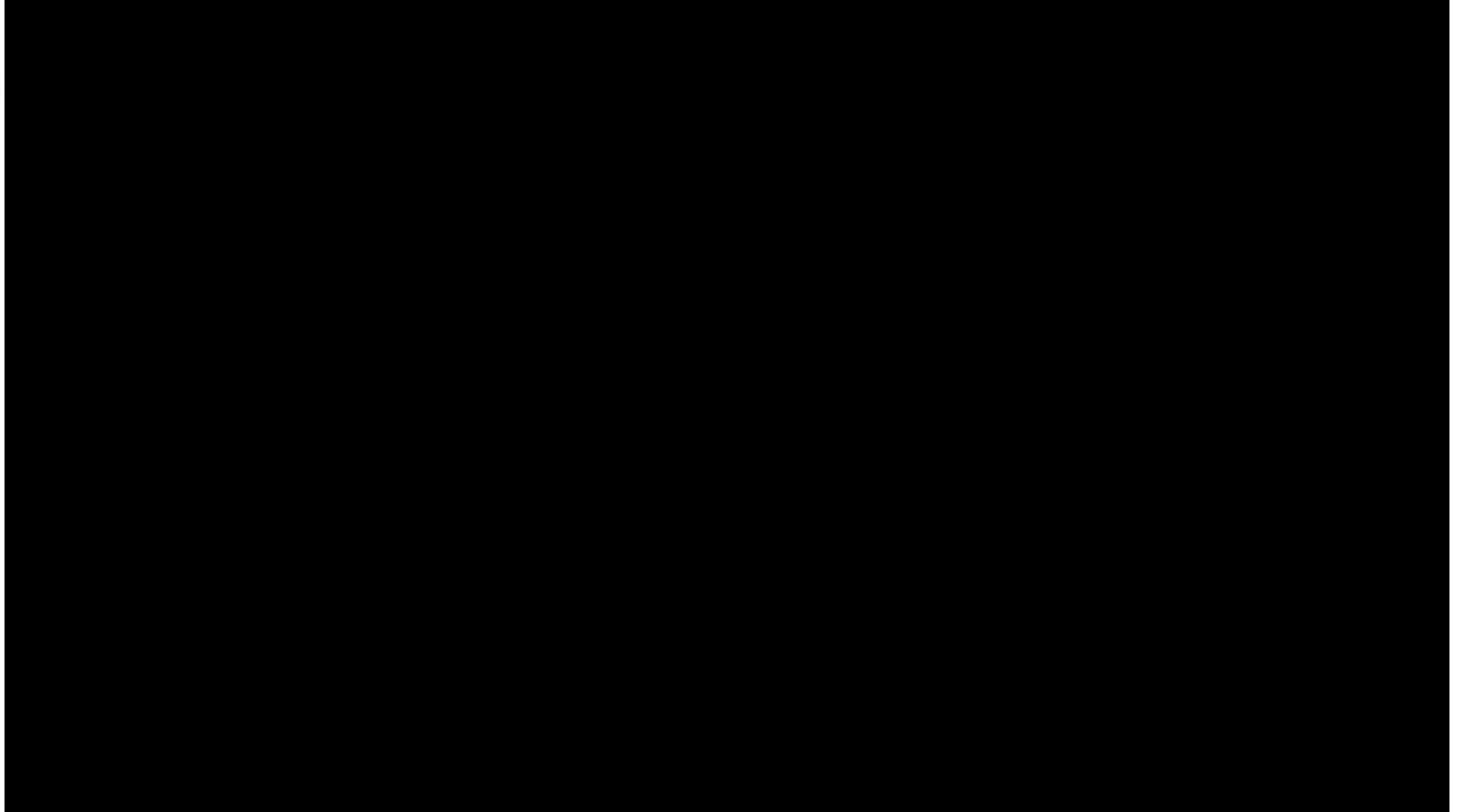
## Design for 3DFashion™

It is recommended to start with geometries that have positive angles (no overhangs), to minimize the use of support material on the fabric.



# But... Can we only print on pieces of textile?

What if I want to print on already confectioned garment?



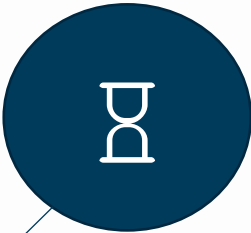
# 3DFashion™ - Value Proposition

## Key Elements

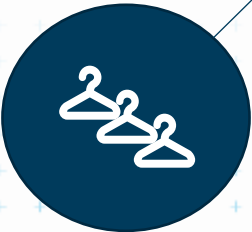
Freedom of design



Short time-to-market



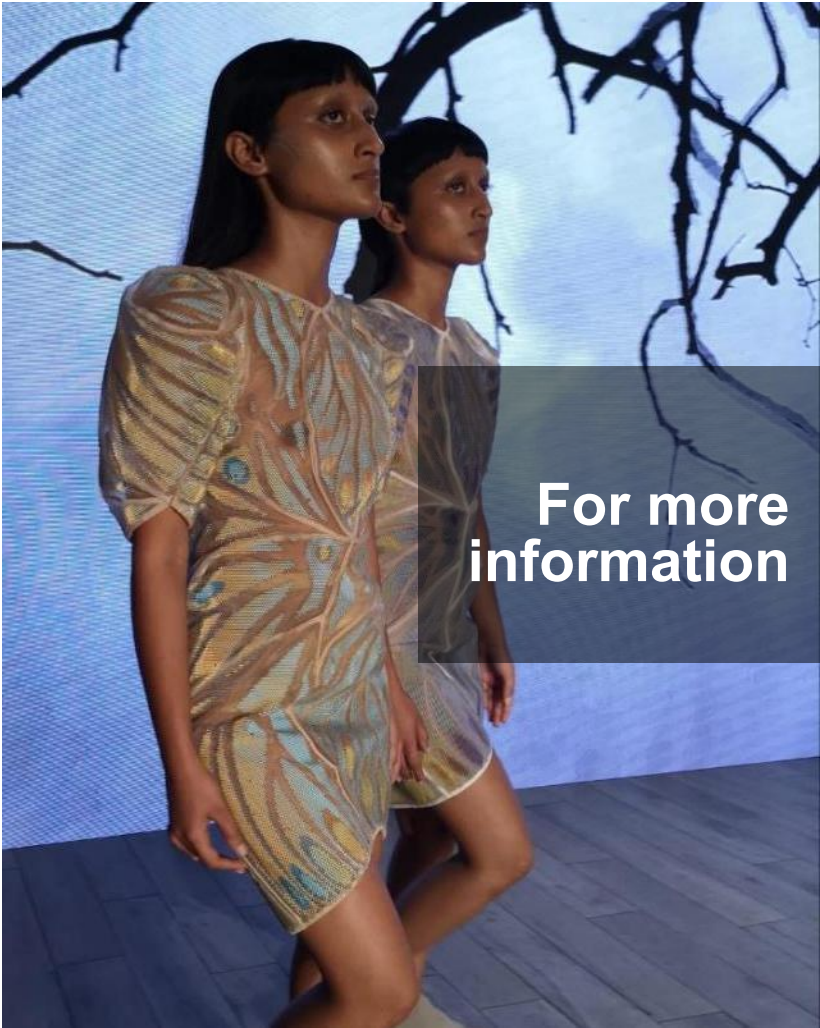
Bespoken & Short Series



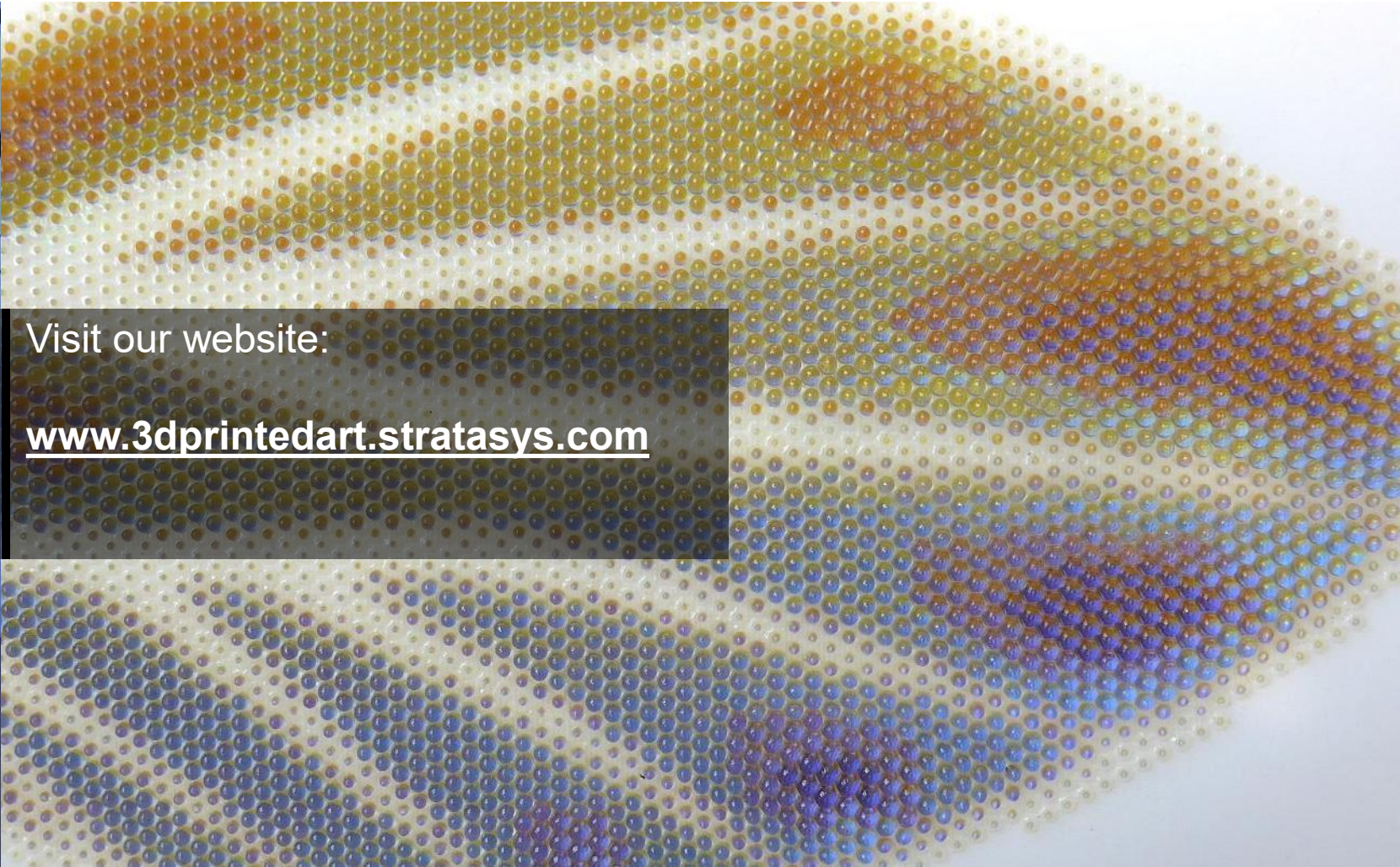
Personalization



Thank you !



For more  
information



Visit our website:  
[www.3dprintedart.stratasys.com](http://www.3dprintedart.stratasys.com)

