



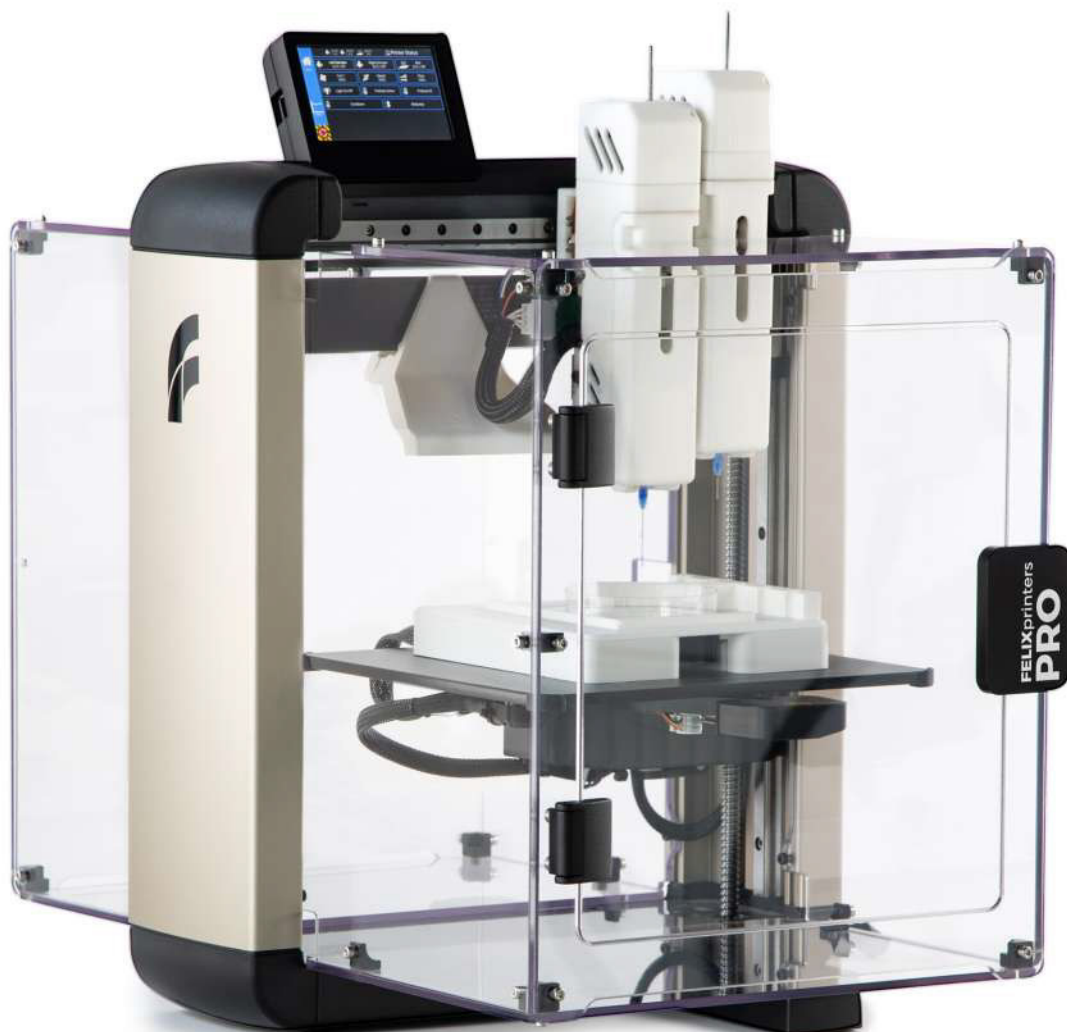
**FELIX BIOprinter**  
High Performance  
Customizable 3D BIOprinting

# THE FELIX BIOPRINTER

## HIGH PERFORMANCE, CUSTOMIZABLE 3D BIOPRINTING

If you are looking for the ultimate 3D printing bio research instrument in a cost-effective package, then you need look no further than the FELIX BIOPrinter.

The FELIX BIOprinter is designed to extrude a broad spectrum of material types and viscosities, and is ideal for the researcher who values ease-of-use, and who needs a system which can be customized for the precise requirements of a particular application. The BIOprinter is made with design freedom in mind, and includes various features that enhance the accuracy of the printing process, while at the same time ensuring that the process is cost-effective and easily sterilizable.



The BIOprinter is issued with CE certification, and is hand-made in the Netherlands meaning that you can have ultimate confidence in its quality and reliability.

The FELIX BIOprinter at a glance

**Touchscreen**

with user friendly interface and embedded print server guides users through prints. Wifi & LAN capability allows you to operate the system from a distance

**Camera**

The module enables easy progress monitoring and easy creation of time lapses and videos

**UV curing system**

UV light with 365nm wavelength, 2W at high intensity. Enables quick curing of layers

**Open system**

Allows user to use any standard 5 ml Luer lock syringe, and standardised petri-dishes and culture plates, so there are no limitations on auxiliary parts and materials, giving you the flexibility to conduct your research.

**Homogenous heating and cooling**

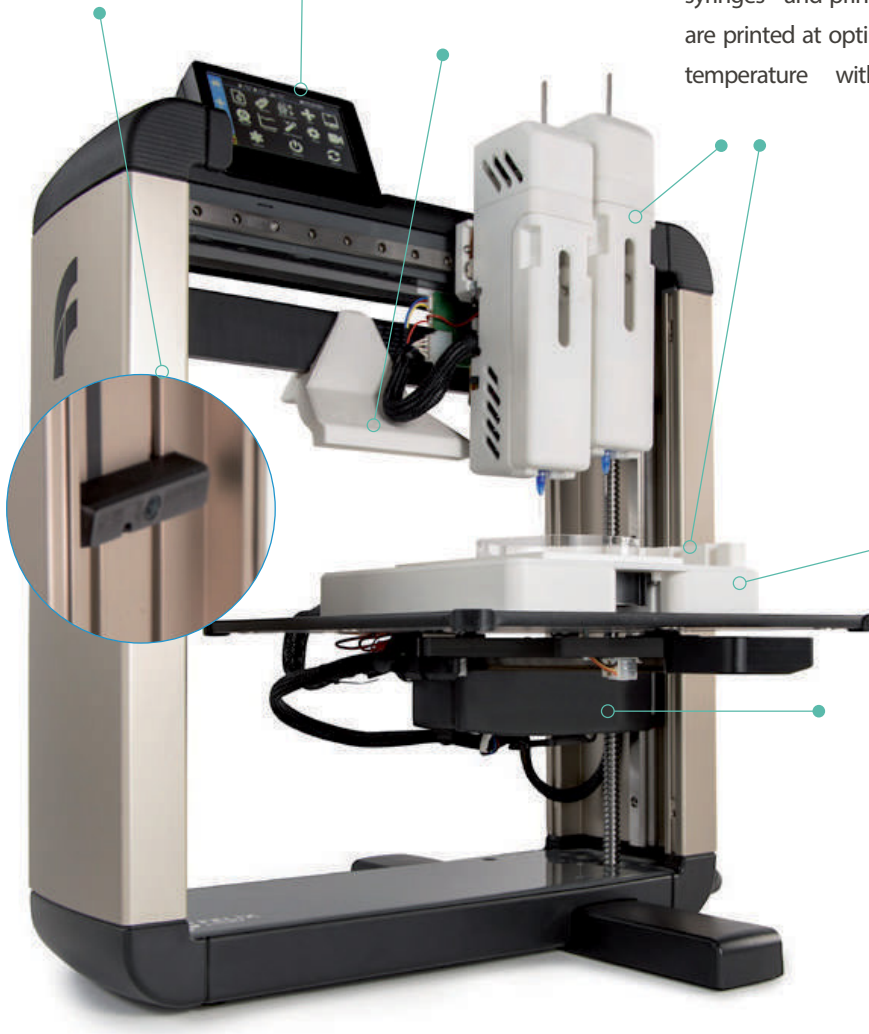
Homogenous heated and/or cooled syringes and print bed to ensure cells are printed at optimal preservation temperature within 0,5°C variance

**Smart print-bed module design**

Allows easy placement of a wide range of standardized containers of petri dishes and well plates

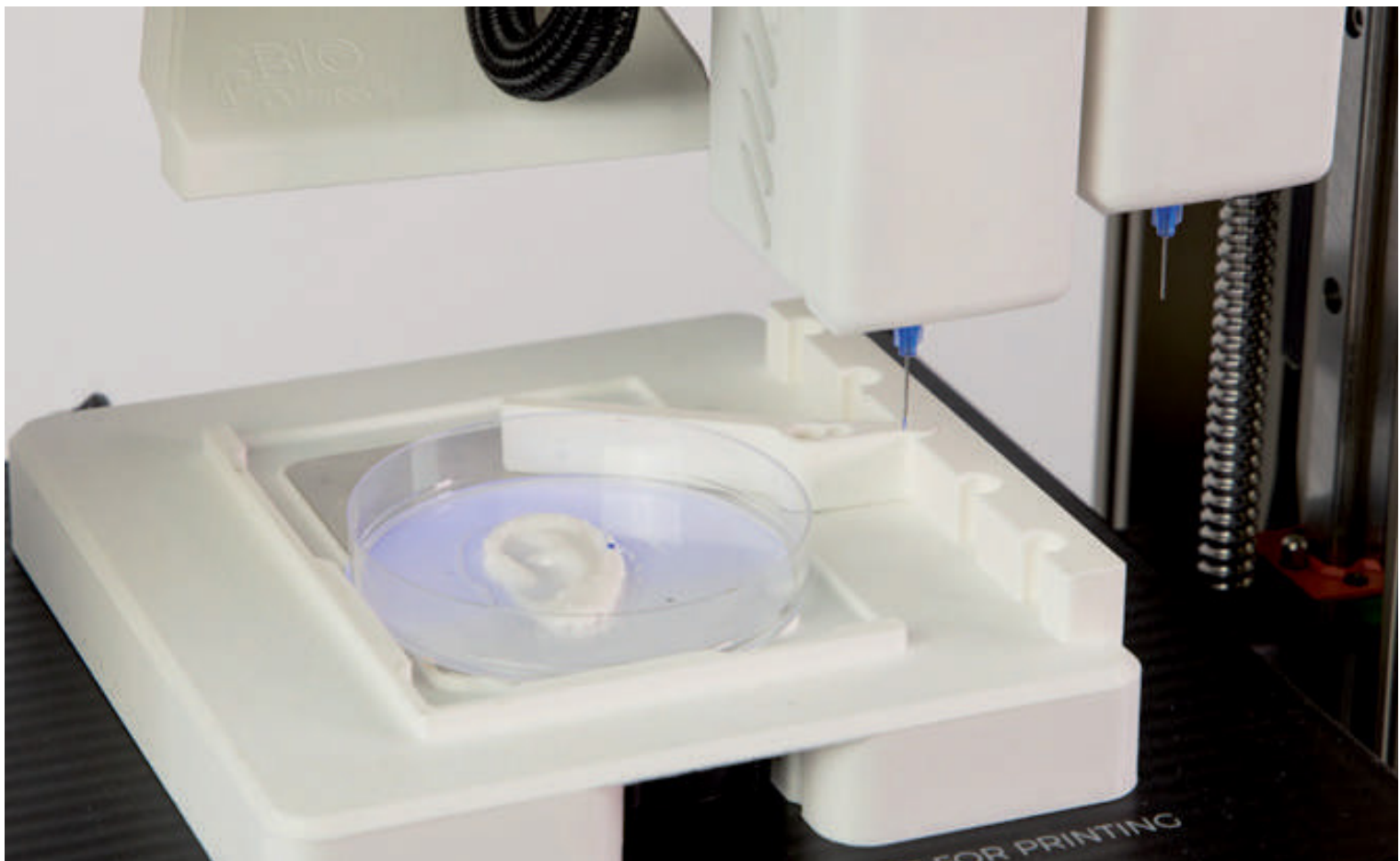
**Automatic bed leveling and calibration**

Unique nozzle probing system gives a perfect first layer and saves valuable research time



## Machine Specification

Layer Resolution	to 50 microns
Build Plate	Aluminium Sandwich plate with Steel Flexplate
Print head	Dual Syringe Operation
Syringe Specs	5 ml syringe(s), Piston Extrusion System
Build Speed /s	Recommended build speed is 20mm/s. Speed depends on material viscosity.
Typical Print Accuracy	± 0.05 mm for size below 20mm
Syringe Min / Max print Temperatures	0 to 50 deg C
XYZ Resolution	XY : 1.6 microns, Z: 0,15 microns
Dimension & Weight	430 x 390 x 550 mm , 11.5 kgs
Build Volume	XYZ = 130 x 210 x 130 mm
Extrusion Width	Greater than 0.1mm, depending on nozzle size
Extrusion force of syringe	100N
Homogenous Temp. Controlled Build Plate	Yes; 0 - 50 deg C
Cover	Plexi Glass Cover



## Ideal bio research instrument in a cost effective package

3D BIOprinting for medical, **scientific** and research applications. 3D print viscous materials up to the highest viscosities with a powerful extrusion system.



### Quality and reliability, you can trust

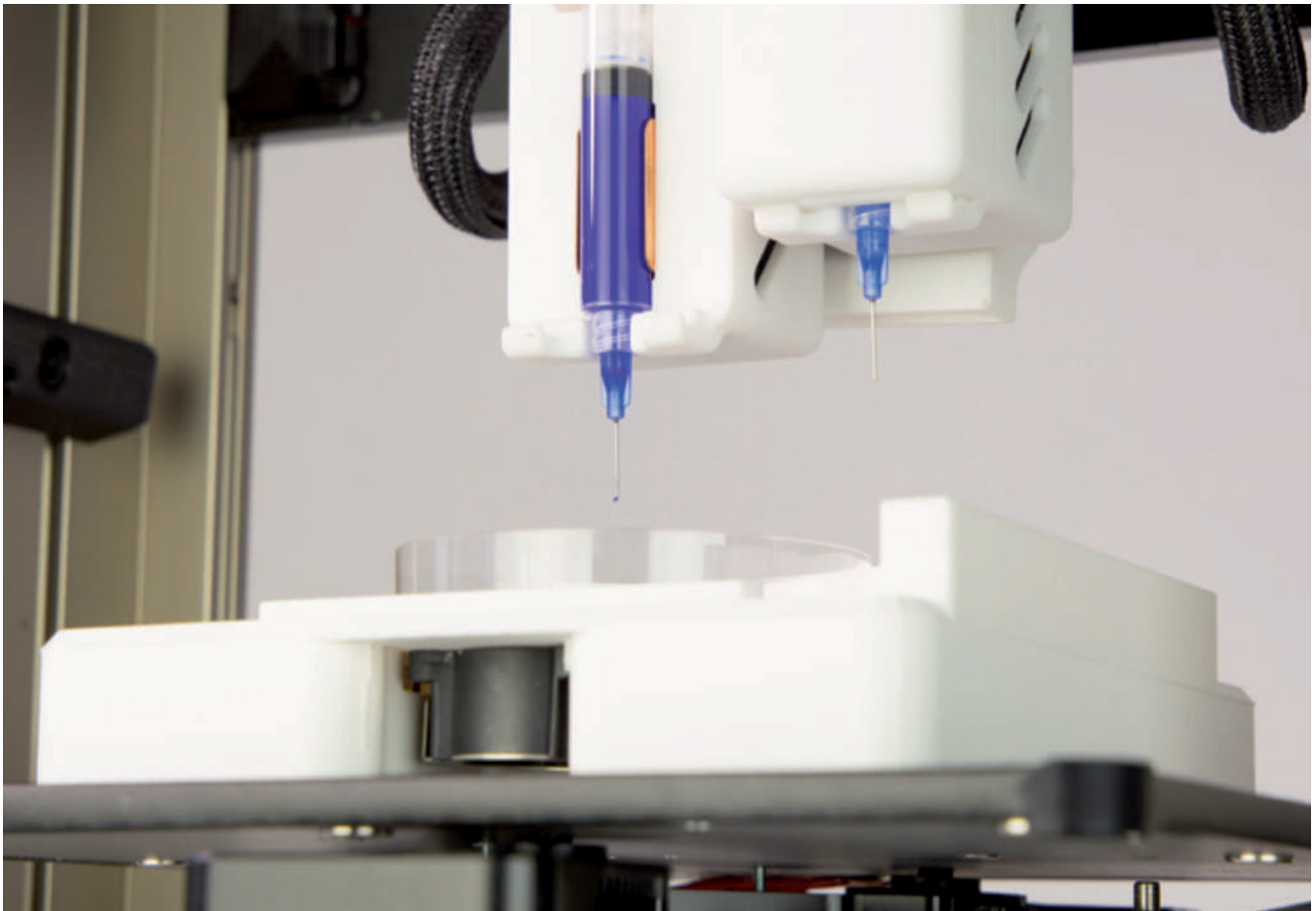
- The BIOprinter is built on at least 10 years' extensive experience in developing and building 3D printers. We've used this expertise to give you the best possible BIOprinting user experience.
- Ease of use thanks to the intuitive printing process, one-touch automated functions and ergonomic design, so you can use 3D BIOprinting in your work, hassle-free.
- All FELIX BIOprinters are manufactured from airplane grade aluminium, engineering grade plastics, glass filled Nylon and POM.

The FELIX BIOprinter was developed by the brightest minds for the most advanced bioprinting technology. FELIXprinters partnered with a team of Early Stage Researchers from training4crm and the Technical University of Denmark and was backed by funding from the European Union Horizon 2020 Programme.

## Dual Piston Extrusion system

Piston-extrusion capabilities:

- Print viscous materials up to the highest viscosities with the powerful piston extrusion system.
- No leakage/contamination from nozzle during printing
- Retractable printhead allows accurate dosing of the medium with an extruding resolution of 0.18 nanoliter per motor step.



## Syringe features:

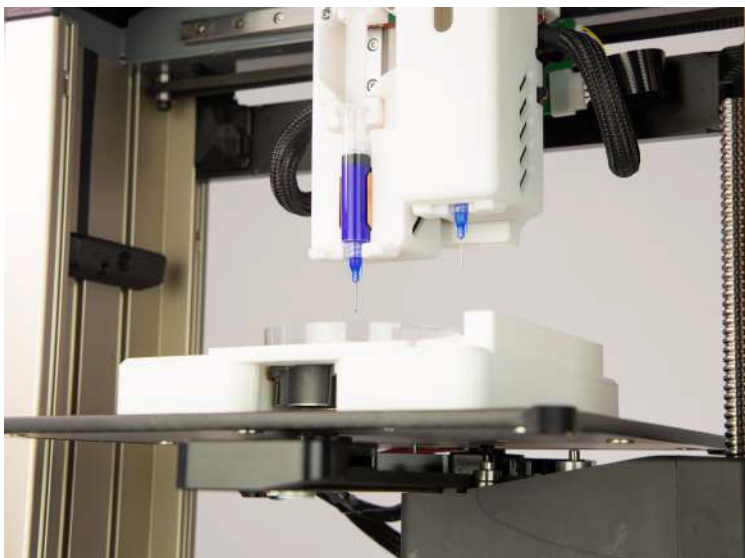
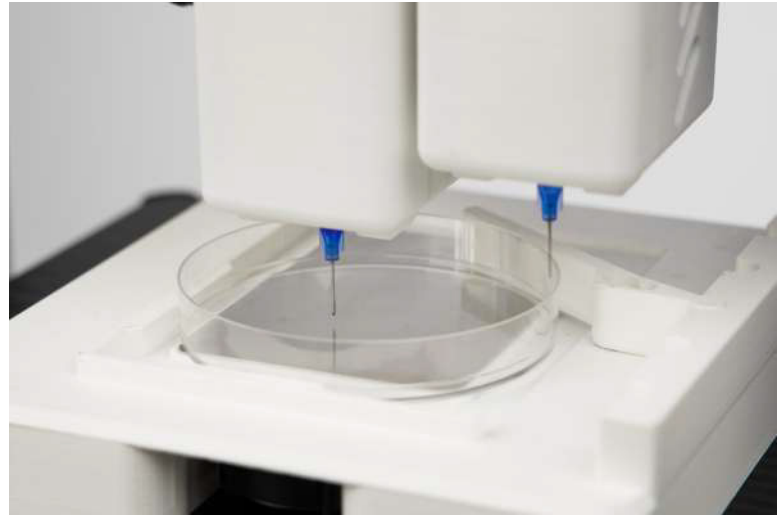
- Eliminate cross contamination of syringes by the non-used print-head lifting and syringe piston retracting
- Quick swap system
- Extrusion width typically ranges from 0.1mm up to 1 mm, depending on nozzle size used

# FUNCTIONALITY

## DUAL HEAD PRINTING

The FELIX BIO printer operates a dual syringe system that allows the users to print with two different material types within the same print.

Alternatively, this system set-up also permits petri dishes to be filled with multiple objects using different materials in a single print run, which can speed up specific research activities and avoid time-consuming material changeovers.



## SYRINGE AND PRINT BED HEATING / COOLING

Temperature-sensitive bio-inks can be regulated at specific temperatures between 2°C and 50°C with syringe and print bed heating and cooling.

The uniquely designed print bed facilitates easy placement of a wide range of standardized containers.

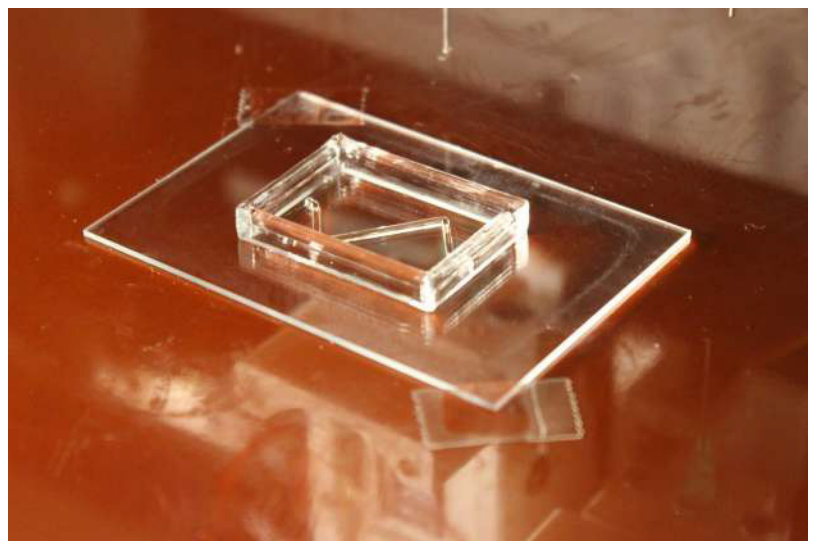
- o From 40ml to 100ml petri dishes.
- o Designed to secure well plates.

## MATERIAL DISPENSING

Material dispensing on the FELIX BIOprinter is performed with a high precision linear motor.

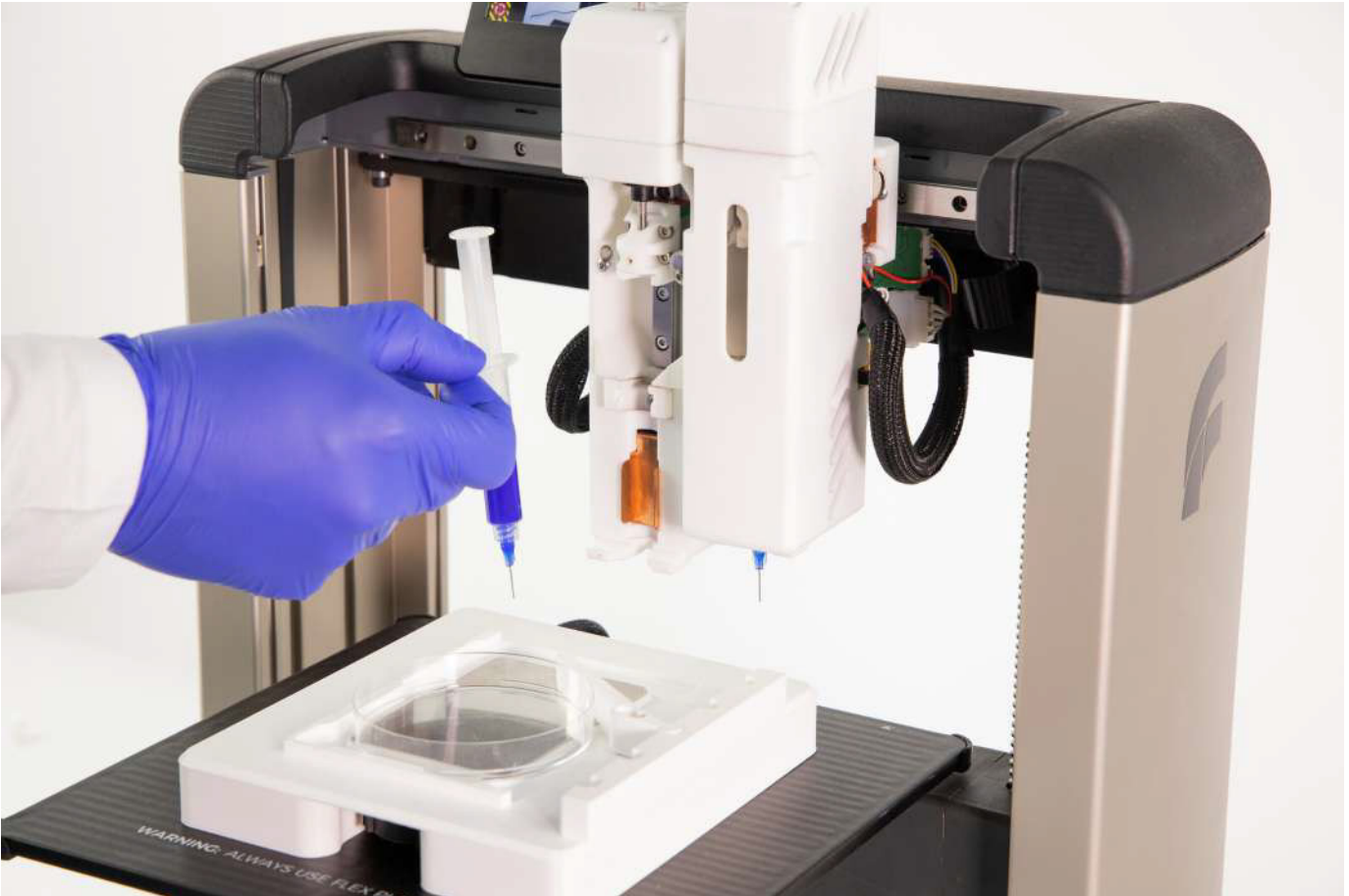
This allows accurate dosing, flow and retraction capabilities.

These are crucial criteria for reliable and precise end results.



## DESIGN

DESIGNED FOR MEDICAL, SCIENTIFIC, AND RESEARCH APPLICATIONS



The printer is characterised by key features that are specifically designed for medical, scientific, and research applications, including syringe cooling / heating, print bed cooling and heating, a dual head system, easy syringe positioning (ergonomic access to the machine supports researchers in their work), and automatic bed levelling.

The printer has a flexible, adaptable ecosystem that will meet the wide range of researchers' needs. One major advantage is the source control system which enables the user to use standard slicing software and make changes themselves if needed.

Syringes are not restricted to expensive brand-specific or in-house produced products that essentially drive up operating costs. The machine instead has been designed to use a standard 5 ml syringe, and standardised petri-dishes and culture plates, so there are no limitations on auxiliary parts and materials.

The FELIX BIO has retraction capability, which is not possible with alternative air pressure systems, even when it is required to control liquid flow. The FELIX BIO can retract with a highly precise motor, which also allows for better dosage of materials and more accurate material flow.

The FELIX BIO is appropriate for all types of bio-printing research, and is equipped with strong motors that can extrude a range of different viscosity of materials



## EASE OF USE

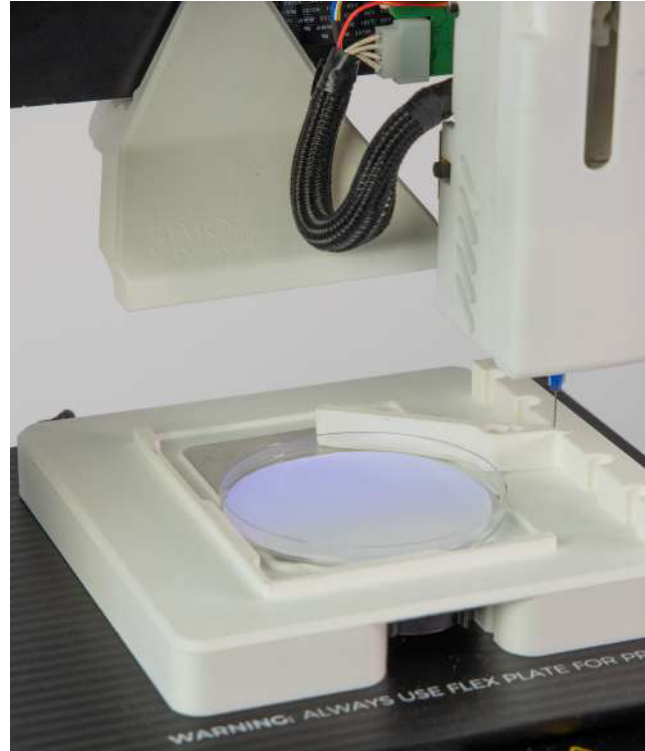
### DESIGNED WITH SIMPLIFIED FEATURES

#### Automatic bed levelling

The bed levelling system works via physical probing of the nozzle against the print surface. Different lengths and size nozzles/needles can be used and easily exchanged to meet specific needs. A perfectly calibrated print bed results in a perfect first layer, leading to accurate results.

#### UV Curing Module

UV curing Module, allow to print with UV curable viscous materials, enabling quick curing between printing of each layer.



## TECHNOLOGY AND SOFTWARE ARE

#### INTUITIVE TOUCHSCREEN

Touchscreen provides all relevant information needed to keep you up to date with the status of your print.





## BUILD PLATE

### PRINTING CAPABILITY

Print directly on the heated build plate Or use the separate cooled/heated unit for petri dishes, microplate and more



Technical University of Denmark

