BIO X

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Tool Type: 3D Printer
Location: Elings Hall 2436
Principal Scientist
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Description: BIO X
Manufacturer: CELLINK Life Sciences

About

The Lumen X, leverages digital light processing (DLP) printing to offer users high resolution, high throughput and high fidelity. The Lumen X divides 3D models into stacks of horizontal layers in the form of black and white image files. Using an industrial-grade visible-light projector, each image is projected onto a droplet resin on a polydimethylsiloxane (PDMS) vat. The illuminated regions react and solidify, then the build platform moves the cured layer up and out of the way, so that more resin can be cured with the next image.

Detailed Specifications

* **Print technology:** FDM
* **Pixel resolution (XY):** 20 µm
* **Layer thickness** 20 µm
* **Power:** 10 - 30 mW/cm^2
* **Z-precision (motor-driven):** 5 µm
* **Heated Platform:** Max 37 ºC
* **Max build volume:** 128 X 85 X 37 mm (400 mL)

Power in mW/cm^2 at certain intensity percentages

25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
8.12	10.36	13.30	15.83	18.24	20.58	22.58	24.37	26.42	28.31	29.85

Intensity vs power in mW/cm^2

20 mW/cm^2	25 mW/cm^2	30 mW/cm^2
50%	64%	76%

Safety Concerns

The print bead or platform is heated. Follow the following precautions:
• Always inspect equipment prior to use. Check for cracks before using
• Do not use in the presence of flammable or combustible materials. Fire or explosion may result
• Read the manufactures' instructions before using
• Do not place metal foil or metal containers on the print bed – the top can be damaged and shock hazard may result

This printer uses UV light to clean the chamber. Humans cannot perceive UV directly so follow the following precautions when using it.
• Never look directly at the UV light source
• The epithelial cells of the cornea absorb radiation in the actinic portion of the UV spectrum (200 – 315 nm). This exposure produces symptoms known as photokeratitis, which are not felt until several hours after the exposure. Photokeratitis is very painful and produces the sensation of having sand in your eye. It also causes an aversion to bright light, as well as the production of tears. The effects typically last up to 48 hours but will disappear as the cells of the cornea are replaced. Long-term effects can also occur. Most of the UV radiation that enters the eye is absorbed in the cornea, but UVA absorption by the lens can alter proteins in the lens and result in cataract formation.
• Excessive UV exposure in the actinic range (200-315 nm) produces symptoms that are comparable to sunburn and includes redness, swelling, pain, blistering, and peeling of the skin.Factors that can affect skin response to UV include your degree of skin pigmentation and photosensitization by certain foods (e.g., figs, limes, parsnips and celery root) and drugs (e.g. tetracycline).You will recover from short-term skin damage, but chronic exposure to UV may increase your risk of skin cancer.
• Protective Clothing: Wear a fully buttoned lab coat, long pants and closed toe shoes. Make sure that ALLskin is protected, including face, neck, hands and arms. Make sure there are no gaps in your protective clothing, especially at the wrist and neck areas. Gloves: Wear disposable latex or nitrile gloves to protect exposed skin on the hands. Do not use vinyl gloves, which can transmit significant amounts of actinic UV. Eye/Face Protection: Always wear a full face shield. To protect the eyes and face, use a polycarbonate face shield stamped with the ANSI Z87.1-1989 UV certification. See the next slides for more information about face shield use. Note: if you're working with splash or projectile hazards, you may also need to wear safety glasses or goggles under the face shield.

Interchangeable Print Heads

pneumatic head	electromagnetic head	syringe pump head
 T = 30 - 65 ºC (± 0.5 ºC) 3 mL cartridge	 T = 30 - 65 ºC (± 0.5 ºC) different dropsizes 3 mL cartridge	 T = 30 - 65 ºC (± 0.5 ºC)
temperature control head	**thermoplastic head**	**pneumatic head**
 T =4 - 65 ºC (± 0.5 ºC) 3 mL cartridge	 several nozzels T = 250 ºC ideal for: PLA, PCL, PLGA	 T = 30 - 65 ºC (± 0.5 ºC) 3 mL cartridge

Reference Documentation

biox_manual.pdf

biox_temperature-control-3.3.pdf

penumatic-3.1.pdf

emdmanual-3.2.pdf

syringe-3.3.pdf

thermoplastic-3.0.pdf