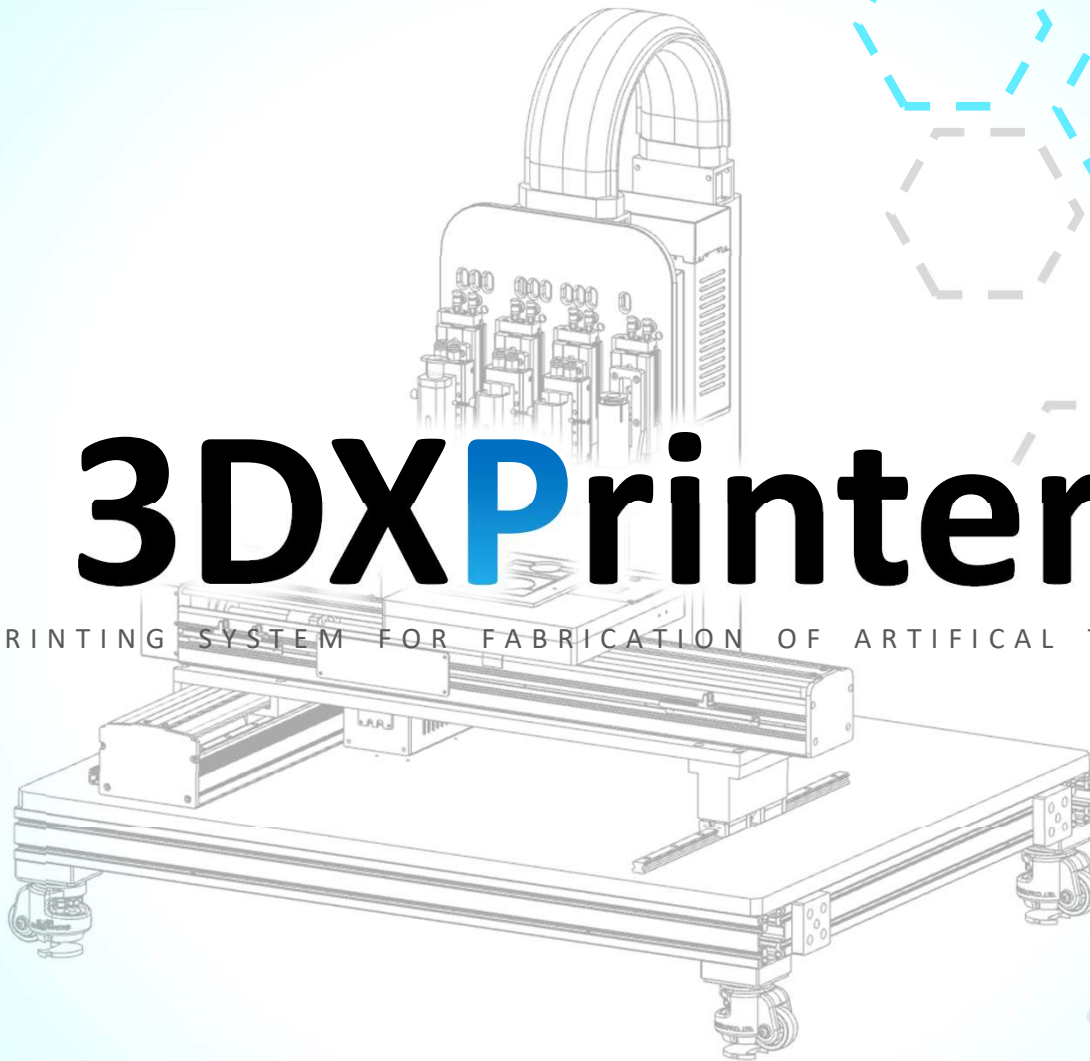


T&R Biofab

3DXPrinterTM

3D BIO-PRINTING SYSTEM FOR FABRICATION OF ARTIFICIAL TISSUES/ORGANS



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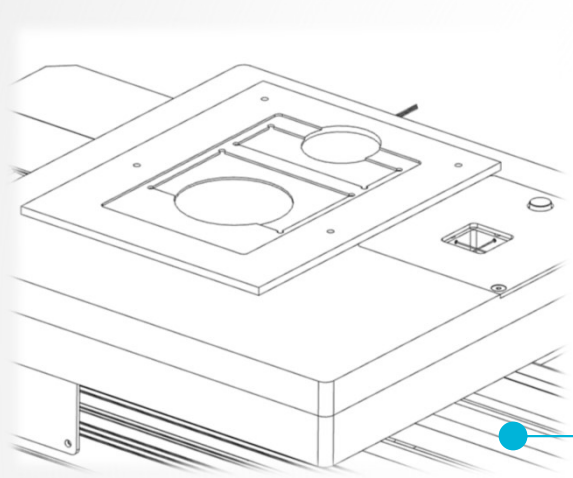
Company Profile

T&R Biofab Co., Ltd. (Tissue engineering & Regenerative Medicine, Bio-Fabrication)

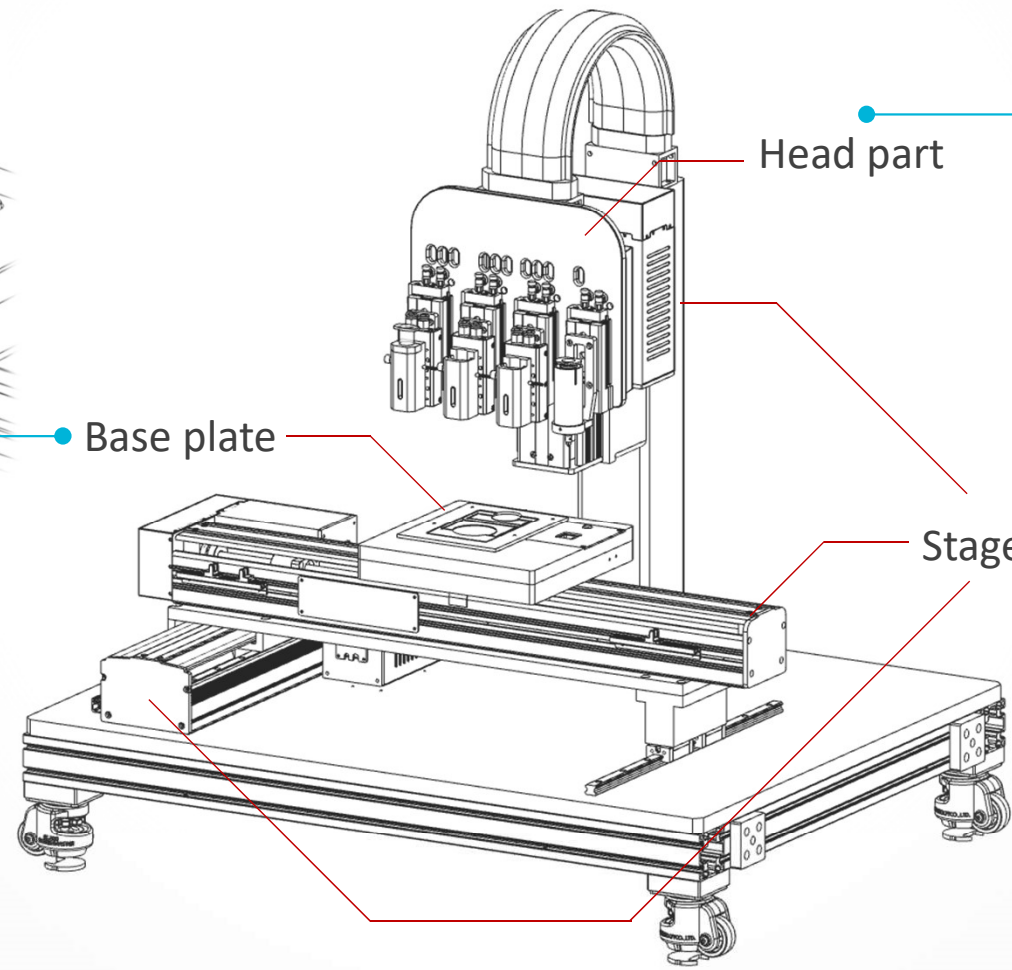
Business Area	3D printed bio-resorbable medical device Tissue engineering & regenerative medicine technology in clinical applications
Establish	March. 2013
Products	4 th Grade Medical Device (kFDA), Research Grade Bioink (deCelluid®), 3D Bioprinter (3DXPrinter)
Approval	KFDA Approval – 16 th July 2014 with 249 items (as of Sep. 2015)
Partners	POSTECH, Seoul St. Mary's hospital, Samsung Medical Centre, Chonnam National Univ., Pusan National Univ., Wonik Corp.

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Detail view

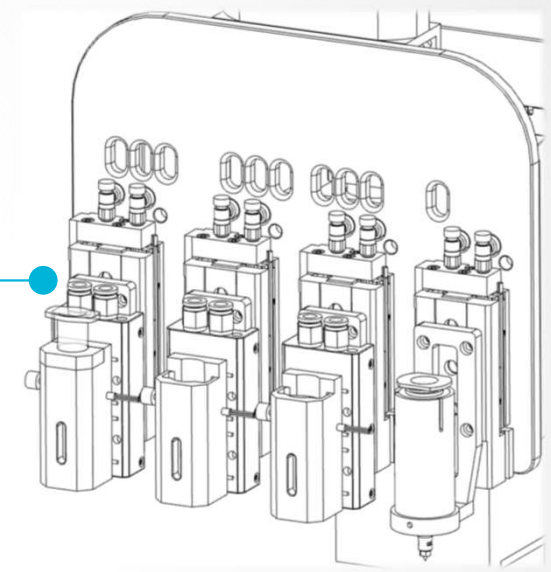


Base plate



Head part

Stage system



Specification Table

The 3DXPrinter series can be tailor-made by reviewing the customer's needs and requirements

	3DP - Printer	3DC - Printer	3DI - Printer	3DX - Printer
Printing type	Pneumatic	Pneumatic	Inkjet	Pneumatic/Inkjet
Using material	Polymer(PLA, PLGA...)	Bio ink, Hydrogel, Mixing Cell liquid	Bio ink, Hydrogel, Mixing Cell liquid	Polymer, Bio ink, Hydrogel, Mixing Cell liquid
Temp. controller	25°C ~200°C	Optional choice Cooling / Heating	Optional choice Cooling / Heating	Optional choice Cooling / Heating
Syringe type	SUS syringe(10ml)	Plastic syringe(10ml/3ml)	Plastic syringe(10ml/3ml)	Plastic syringe(10ml/3ml), SUS syringe(10ml)
Nozzle I.D	0.1~1.0mm	0.1~1.0mm	0.1~1.0mm	0.1~1.0mm
Stage precision	± 5 μm (X, Y, Z)	± 5 μm (X, Y, Z)	± 5 μm (X, Y, Z)	± 5 μm (X, Y, Z)
Pneumatic range	0~600kPa	0~600kPa	0~600kPa	0~600kPa

Optional Function

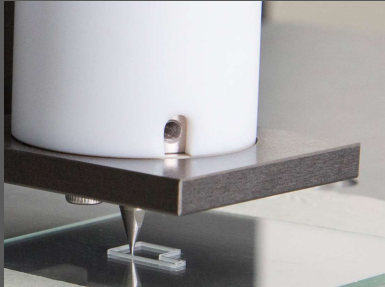
Sterilization system(UV Lamp, UV cut film) / Video device(USB Type, Pixel type) / Auto calibration system / Multi syringe holder/ Multi substrate holder/ GMP Grade parts / Housing type / Cooling & Heating system

※ Stage size (working area) can be different depending on the required maximum fabrication size

※ Number of heads, size and shape can be changed according to order requirement

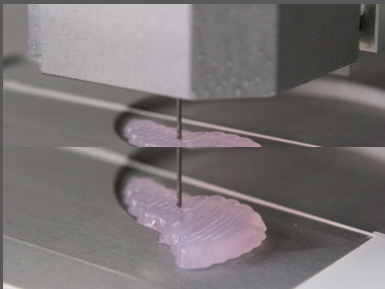
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Series



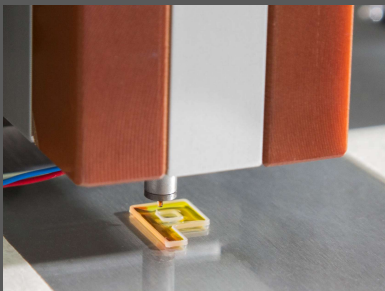
3DP-Printer (Polymer)

- 3DP Printer is a printing system that is used for making 3D model by melting biodegradable polymers.
- PCL, PLA, PGA, PLGA, PDO, PEG etc.



3DC-Printer (Hydrogel)

- 3DC Printer is a printing system that can fabricate artificial tissues/organs using bioinks (hydrogel+cells).
- Collagen, gelatin, alginate, chitosan, decellularized extracellular matrix etc.
- Bone marrow stem cell, Adipose derived stem cell, HapG2, Fibroblast, Pre-osteoblast etc.



3DI-Printer (Solution)

- 3DI Printer is an inkjet-based printing system that can be used to directly print thin layers using low viscous solution like cell suspension.
- Cell culture medium, low viscous hydrogel etc.



3DX-Printer (Hybrid type)

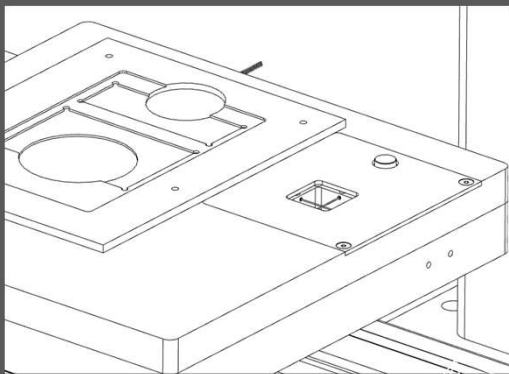
- 3DX Printer is a hybrid printer that applies various dispensing type (FDM & jetting), which can be fabricate 3D structures with multiple materials and scale.
- Because the printer can be configured with a variety of printing heads, a variety of materials (polymer, hydrogel, solution) can be used to make one structure.

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Additional Functions

Auto calibration

- Auto calibration system improves the printing accuracy by precisely correcting the position of the nozzle.
- It is very convenient that the user does not need additional work when changing the nozzle.



Temperature controller

- The temperature control system is located in the head and base plate parts that are in contact with the material. Cooling system is used in 3DC, 3DI, 3DX printers.
- Polymer printing head : 25 ~ 200°C
- Hydrogel printing head & bed : -20~200°C



Parts for cleanroom use

- All 3DXPrinter series are made up of dust-free parts available in a cleanroom (air hose, cableveyor, mist separator) to minimize contamination.
- Mist separator filtration : 0.01µm (efficiency : 99.9%)

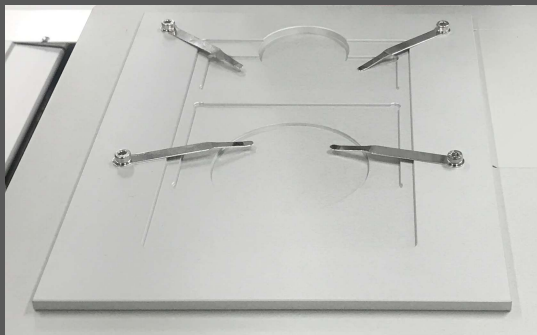


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Additional Functions

Multi substrate holder

- The base plate is designed to be universally applicable to a variety of substrates commonly used in biotechnology.
- Commercial substrate, cell culture dish, slide glass, petri dish, etc. can be used.
- Fixing the Substrate using a stator to prevent fine movement during printing.



Multi syringe holder

- The head for hydrogel printing is configured to use syringe of various capacity to improve user's convenience and it is configured to check the residual amount of material even during printing.
- Syringe capacity : 3 ml & 10 ml



UV System

- To prevent contamination of materials from contaminants that may be present in base plate and other devices before printing, UV lamp for sterilization is constructed.
- In addition, to minimize external UV exposure, UV cut film is attached to all windows to improve user safety.



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Additional Functions

Housing Type

The 3DXPrinter is made up of three types of housing types to optimize the user's environment and enhance convenience.

- 🟡 **OPEN type** : Individual parts are separated independently without housing
- 🟡 **SEPARATE HOUSING type** : Electronic box, Printer, Printer housing is composed of one body, and controller is separated.
- 🟡 **ONE-BODY HOUSING type** : Controller, Electronic box, Printer is composed of one housing

OPEN type



SEPARATE HOUSING type



ONE-BODY HOUSING type





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