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P R O D U C T M A N U A L

# 3D PRINTING SOLUTIONS FOR MEDICAL APPLICATIONS



Shenzhen Piocreat 3D Technology Co., Ltd.

# MEDICAL REHABILITATION



## Insole Customization Solution..... 01

Gait Analyzer - FD 01

3D Foot Scanner - FS A001/FS A002/FS A003

FDM 3D Printer - IPX2



## Scoliosis Treatment Solution ..... 06

High Temperature Pellet Printer - MS 01

Custom-made Spinal Orthosis



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Surgical Guide LCD Printer - MG 01

High Speed Curing Machine - UV 02

Surgical Guide Resin Pro - SG Pro



## Surgical Model Solution..... 14

FDM 3D Printer - GS 01

Surgical Model

# Insole Customization Solution

Designed specifically for foot health

## **Abnormal Feet**

Flat feet, high arches, hallux valgus, calcaneus valgus, plantar fasciitis, forefoot pain, etc.

## **Abnormal Gait**

Pigeon toes, knee hyperextension, etc.

## **Abnormal Body Posture**

Lumbar lordosis, uneven shoulders, O/X legs, hunchback, etc.

## **Daily Health Care**

Foot Fatigue Relief, Sport Injury Prevention, etc.

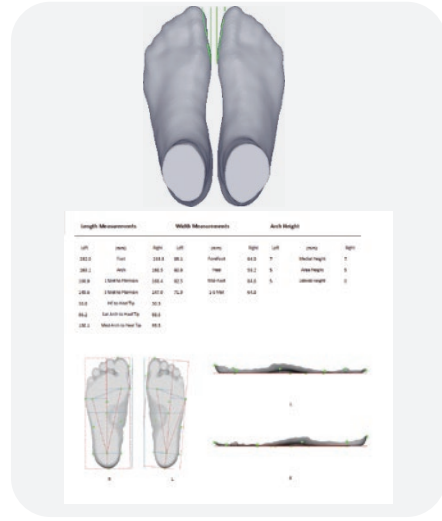




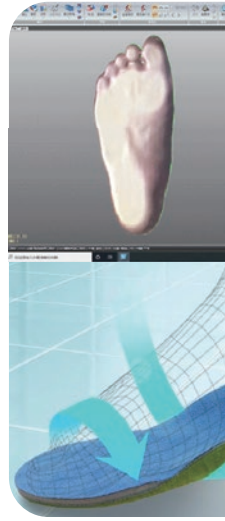
**Gait Analyzer  
FD 01**



**3D Foot Scanner**

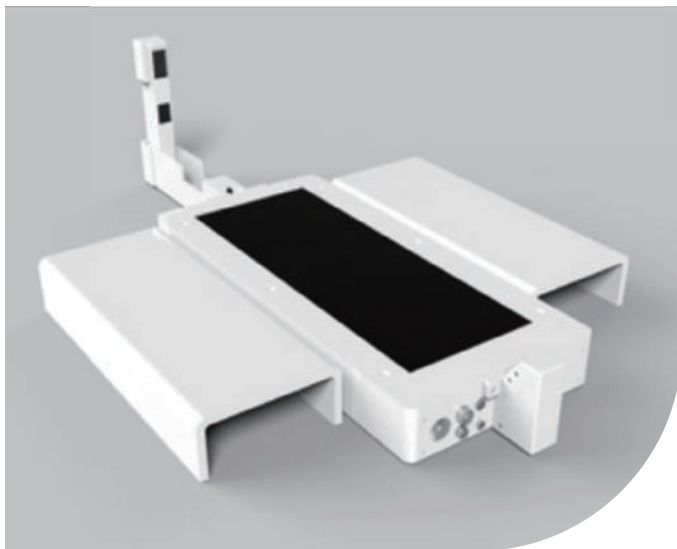


Data Analysis



Customiz

## 3D Foot Scanner FS A001



### FS A001

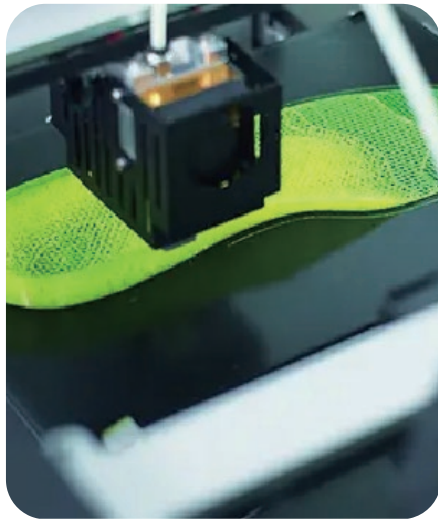
Scanning volume  
**330L\*140W\*W80H mm**

Size  
**455L\*212W\*55H mm**

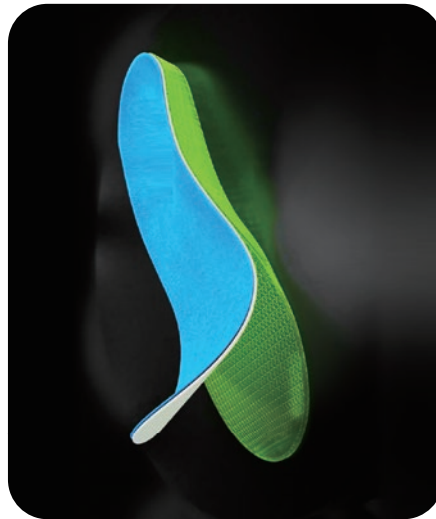
Weight  
**3.2 kg(7.1 pounds)**



3D Design



**3D Printing Insoles**  
IPX2

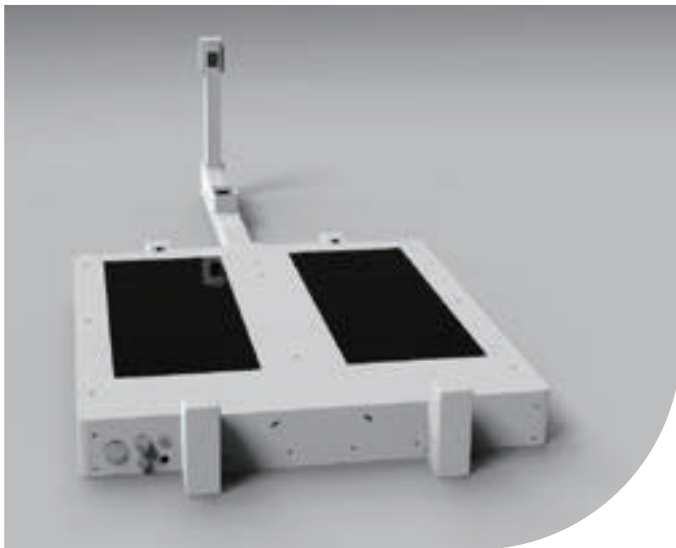


Insole Veneer  
Production



Insole Polishing

## **3D Foot Scanner** FS A002



### **FS A002**

Scanning volume  
**330L\*140W\*80H mm**

Size  
**455L\*430W\*55H mm**

Weight  
**5.9 kg(13 pounds)**

# FS A003

## 3D Foot Scanner

Foot data collecting within 6s

- High-speed, High-accuracy 3D laser scanning
- Suitable for custom shoes and custom insoles
- Full-foot 3D laser scanning with color texture
- Supports plaster negative mold positive mold scanning
- Single-pass scanning time 3.2s



Product model:	FS A003
Operating principle:	Collect high-quality images with 3D laser
Diagnostic items:	More than 20 items of data including foot width, foot length, arch height, heel tilt angle, etc.
Accuracy:	±1mm
Scan speed:	6s
Measuring range:	330mm (L)×130mm (W)×115mm (H)
Suitable foot length:	5cm-30cm
Equipment size:	640mm( L) × 870mm(W) × 1050mm(H)
G.W.:	42KG
Screen panel(optional):	Size: 23.8", Resolution: 1920*1080, Supports multi-touch,Operating system:Windows
Hardware configuration:	CPU: Inter i5 8500 Memory: 8G Storage: SATA256GSSD Rated Power :150W
Max. weight capacity:	180KG(396.83LB)

# IPX2

## Special 3D Printer for custom insoles

Fast printing with independent dual nozzles

### Special extruder

The structure of proximal elf extruder specially developed for flexible material makes the extrusion more stable.

### Independent dual nozzles

Two independent nozzles can print two unique insole models simultaneously.


### 120mm/s fast printing

Produce a pair of adult-sized insoles within 30 minutes.



Product model:	IPX2	Support material:	TPU-95A/90A/85A/80A,TPE-83A
Molding technology:	FDM	Number of nozzles:	2
Machine size:	730×540×490mm	Nozzle diameter:	0.8mm(0.4,0.6mm optional)
Print size:	320×200×200mm	Nozzle temperature:	≤300°C
Ambient temperature	5°C-35°C	Printing method:	U disk, WIFI
Ambient humidity	20%-60%	Operation interface:	11 languages
printing speed:	≤120mm/s	Supported formats:	STL/OBJ/3MF
Printing accuracy:	±0.1mm/100mm	Slicing software:	Piocreat_slicer
Layer thickness:	0.3-0.5mm (standard 0.8mm nozzle)	Operating system:	Windows/Mac OS
Filament diameter:	1.75mm	Power supply:	Input AC100-240V and output 24V
Bearing weight:	≤1KG	Rated power:	150W





# Scoliosis Treatment Solution

Customized spinal orthotic

- Light weight
- Close-fitting plasticity
- Breathable and comfortable
- Personalized appearance

**Data  
Collection**



**Digital  
Design**

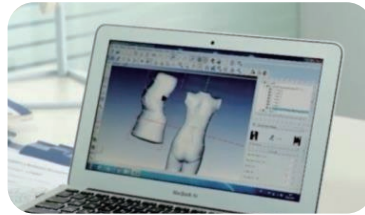


# 3D printed scoliosis orthotic production process



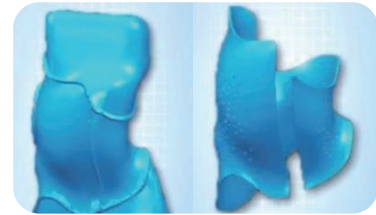
01

High-precision  
3D scanning system



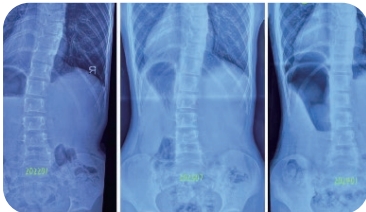
02

Body surface  
three-dimensional data



03

Shape and brace design



06

Comparison of before and  
after orthopedic



05

Orthotic try-on and able  
for second adjustment



04

3D printing model

Orthopedic  
Wearing

Fit  
Adjustment

# MS 01

## FGF fully enclosed 3D printer

### High-temperature pellet 3D printing

#### Fully Enclosed Chamber

Constant temperature work environment, good molding effect. Available for high temperature material printing.

#### Industrial Grade Nozzle Kit

Nozzle temperature  $\leq 400^{\circ}\text{C}$

#### Large printing size

500 × 500 × 650mm

#### Material break detection

Add pellets and continue printing



Product model:	MS 01	Print layer thickness:	0.5-1.5mm
Molding technology:	FGF	Printing material:	High temperature composite materials
Print size:	500 × 500 × 650mm	Discharging mechanism:	screw extruder
Machine size:	870 × 970 × 1521mm	Pellet diameter:	2-5mm
Package size:	1036 × 990 × 1670mm	Printing method:	USB disk
N.W.:	274KG	System languages:	Chinese/English
G.W.:	324KG	Heating bed temperature:	$\leq 110^{\circ}\text{C}$
Number of nozzles:	1	Power requirements:	100-120V~, 200-240V~, 50/60Hz
Nozzle temperature:	$\leq 400^{\circ}\text{C}$	Rated power:	4200W
Printing accuracy:	100 ± 0.1mm	Slicing software:	Piocrat_slicer
Nozzle diameter:	1.0mm standard (2.0, 3.0, 4.0mm optional for sale)		

# Customized Spinal Orthotics

Avoids the orthotic making errors from traditional molding techniques by using three-dimensional scanning. captures a high-precision three-dimensional data model of the human body, and perfectly matches the X-ray film.



## Slim Fit

Integrated 3D printing  
Highly pliable  
Good orthotic effect

## Super Breathable

≥50% breathable hole design on the surface, Permeable and comfortable wear.

## Light Weight

20% reduced thickness  
530g average weight

## Custom Design

Customized hole patterns  
Customized signature

## High Quality

High-quality certified materials  
Bio-compatibility and sensitivity test  
5000 times open-close test

- Hollow design
- High performance special materials
- Long-lasting and durable
- Highly customized perfect fit
- Easy to wear
- Breathable and comfortable
- Suitable for hot weather



# Surgical Guide Solutions

## Provide precise surgical operation

- Piocreat patented Surgical Guide Resin Pro
- Easy forming, high strength, and good toughness
- The guide plate is highly durable during surgical cutting
- Ensuring accurate size of the surgical cutting site
- The resin has passed cytotoxicity testing and other relevant requirements

Precise Surgery

Surgical Guide 3D Printing

Surgical Guide Design

Preoperative Area Design

Data Collection

# MG 01

## LCD 3D printer

### 29µm High-precision 3D Printer

- **High Uniformity Integral Light Source**  
High light uniformity, better than parallel light sources
- **385nm Wavelength High-precision Forming**  
10.3" 8K monochrome screen
- **Highly Stable Z-axis**  
Z-axis dual linear guide + ball screw dual configuration provide higher positioning accuracy



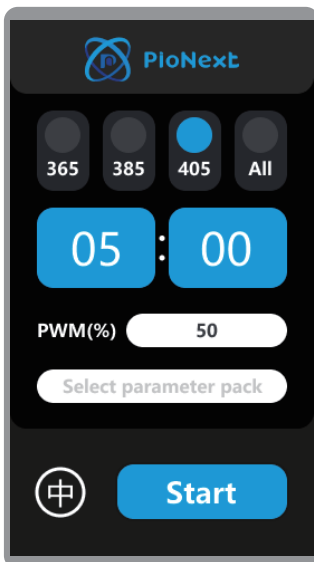
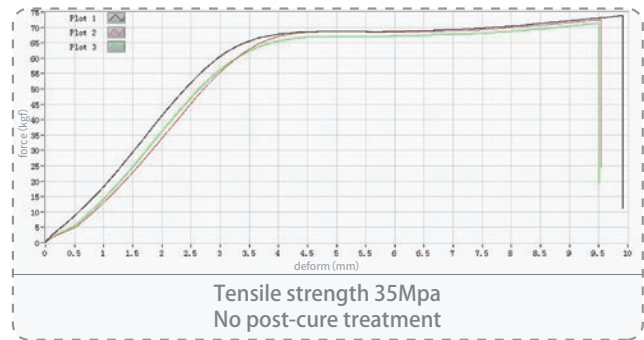
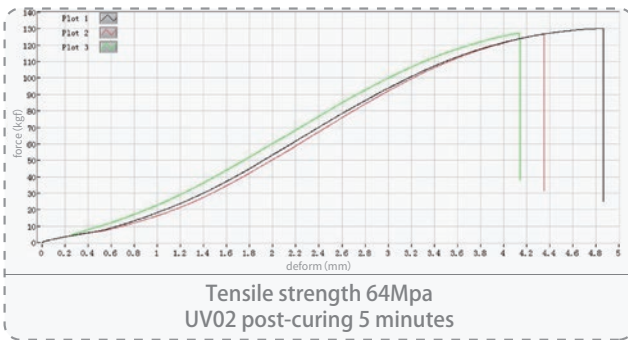
<b>Product model:</b>	MG 01	<b>Print size:</b>	228×128×200mm
<b>Molding technology:</b>	LCD	<b>Resolution:</b>	7680*4320
<b>Printing speed:</b>	70mm/h (0.05mm )	<b>Wavelength:</b>	385nm
<b>Layer thickness:</b>	0.01-0.1mm	<b>File format:</b>	cxdlpv4
<b>XY axis accuracy:</b>	29µm	<b>Connection method:</b>	USB disk, WIFI
<b>Print screen:</b>	10.3" 8K monochrome screen	<b>Package Size:</b>	480×425×720mm
<b>Rated voltage:</b>	100-120V~/200-240V~, 50/60Hz	<b>Machine size:</b>	340×292×552mm
<b>Rated power:</b>	300W	<b>N.W.:</b>	15.77KG
<b>Operating system:</b>	Piocreat BOX (Win7 or above X64, Mac)	<b>G.W.:</b>	20.55KG
<b>Device language:</b>	13 different languages		
<b>Printing material:</b>	Surgical guide resin pro, High fidelity model resin, rigid resin, water-washable resin, PLA bio-based resin, flexible resin, ABS-like resin, highly transparent resin, compatible with third-party resin		

# UV02

## High-speed curing machine

### Adjustable light intensity

- Fast Curing**  
Normally 1-5 minutes
- Adjustable Light Intensity**  
Adjustable light intensity: 5%-100%
- Preset and Customizable Cure Settings**  
8 sets of regular curing data



Product model:	UV02
Machine color:	White
Cured size:	D180×H120mm
Machine size:	366×300×250mm
Package Size:	464×386×334mm
Rated power:	360W
Input voltage:	100-120V~/200-240V~,50-60Hz
Adjustable light intensity:	5-100%
Adjustable curing time:	00:01 - 30:00(Max.30min)
Machine net weight:	11KG
Machine gross weight:	14KG

# SG Pro

## Surgical guide resin pro(Dental/Medical)

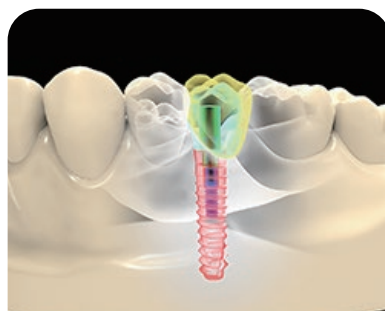
High transparency, high elongation at break and high impact strength

- High Transparency**  
 Improve the accuracy and safety of surgery.
- High Strength and Toughness**  
 Deform without breaking when subjected to external force.
- High Impact Strength**  
 High resilience.
- Supports High-temp Sterilization**  
 Withstand 135 °C without cracking or deforming.

Measurement	Test method	Value
Viscosity, cps (@25°C)	ASTM D 2196	700-900
Density, g/cm <sup>3</sup> (@25°C)	ASTM D 792	1.05-1.10
Hardness, Shore D	ASTM D 2240	75-80
Flexural modulus, Mpa	ASTM D 790	1000-1200
Flexural strength, Mpa	ASTM D 790	>40
Tensile modulus, Mpa	ASTM D 638	230-270
Tensile strength, Mpa	ASTM D 638	>30
Elongation at break,%	ASTM D 638	<b>110-140</b>
Impact strength,notched Izod, J/m	ASTM D 256	<b>240-300</b>
Heat deflection temperature, °C	ASTM D648 @66PSI	60-70



Preoperative tooth position design



3D implant position designing



Dental surgical guide plate production completed



Precision minimally invasive implant surgery



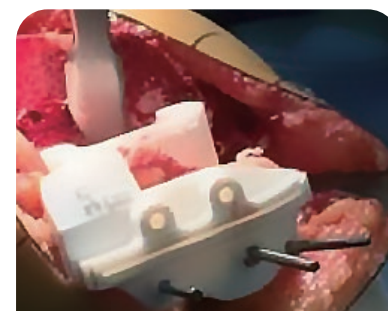
Surgical guide resin toughness test



Medical surgical guide



Preoperative location design



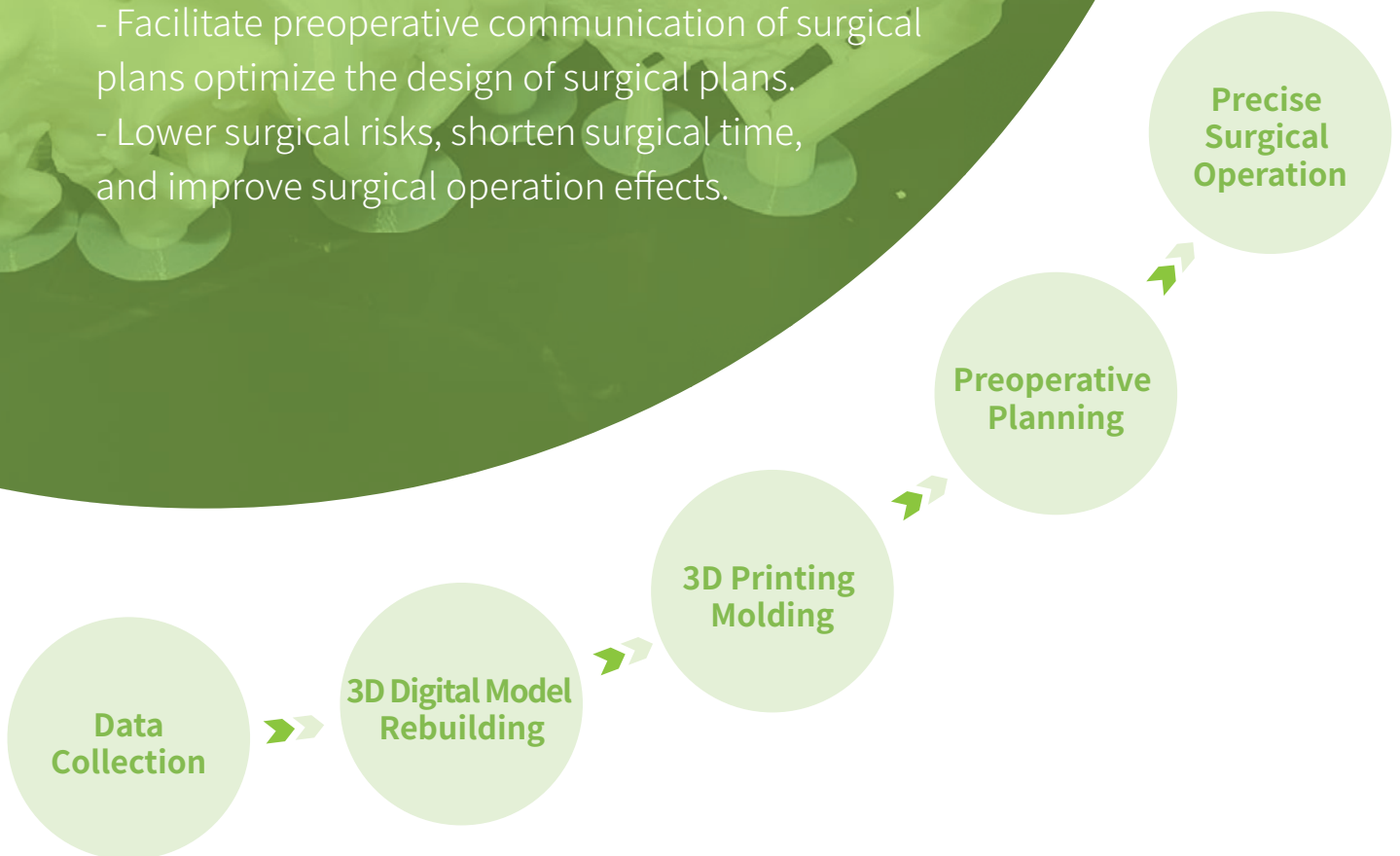
Precise surgery



# Surgical Model Solution

Utilizing digital technology to visualize medical information and assist clinical practice

- Visualize complex tissue structures with 1:1 physical tissue model.
- Facilitate preoperative communication of surgical plans optimize the design of surgical plans.
- Lower surgical risks, shorten surgical time, and improve surgical operation effects.



# GS01

## FDM printer for surgical model application

### Fast printing, more efficient

- 12x Faster, More Efficient**  
 The printing speed is up to 600mm/s and the acceleration is up to 20000mm/s<sup>2</sup>.
- 32mm<sup>3</sup>/s High Flow Hot Nozzle**  
 Heat to 200°C in 40s ensures that the materials are fully melted during high-speed and high-temperature printing.
- Vibration/Layer Optimization**  
 Built-in vibration sensor which can control resonance and optimize layer texture.

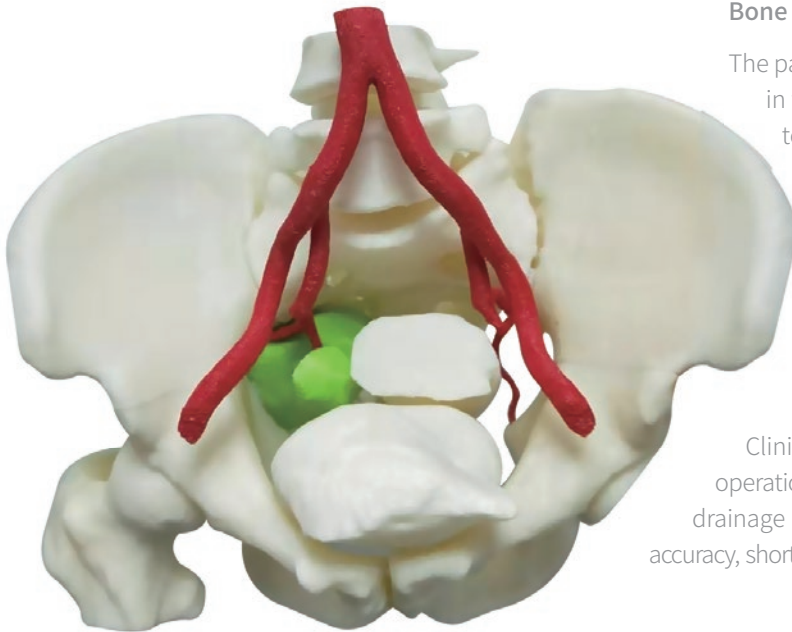


<b>Product model:</b>	GS01	<b>Filament diameter:</b>	1.75mm
<b>Molding technology:</b>	FDM	<b>Nozzle diameter:</b>	0.4mm (optional 0.6/0.8mm)
<b>Print size:</b>	300 × 300 × 300mm	<b>Nozzle temperature:</b>	≤320°C
<b>Machine size:</b>	435 × 462 × 526mm	<b>Heating bed temperature:</b>	≤120°C
<b>Package Size:</b>	545 × 545 × 665mm	<b>Printing platform:</b>	Flexible print platform
<b>N.W.:</b>	18KG	<b>Printing method:</b>	USB disk printing/Ethernet/Cloud printing/ LAN printing
<b>G.W.:</b>	23KG	<b>Rated voltage:</b>	100-240V ~, 50/60Hz
<b>Printing speed:</b>	≤600mm/s	<b>Rated power:</b>	1000W
<b>Acceleration:</b>	≤20000mm/s <sup>2</sup>	<b>Support material:</b>	ABS/PLA/PETG/PET/TPU/PA/ABS/ASA/PC/ PLA-CF/PA-CF/PET-CF
<b>Printing accuracy:</b>	100+0.1mm	<b>Print file:</b>	G-Code
<b>Print layer thickness:</b>	0.1-0.35mm	<b>Slicing software:</b>	Piocreat_slicer
<b>Extruder type:</b>	Dual gear proximal extruder	<b>Slice file format:</b>	STL/OBJ/AMF
<b>Supported functions:</b>	AI camera/AI lidar/resuming operation after power outage/material break detection/air purification /vibration pattern optimization/lighting/automatic sleep		

# Surgical model

It can be used for preoperative surgical planning, surgical rehearsal, and preoperative matching of individualized implants.

Surgical training models for various disease states can be designed and printed according to the doctor's requirements.



## Bone tumor resection surgery

The patient's MR examination revealed a huge bone tumor in the pelvis, and he was subsequently scheduled to be hospitalized for surgical removal.

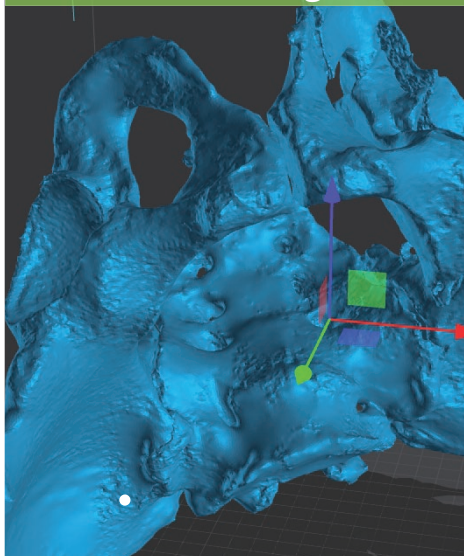
In order to have a reference to the actual size of the tumor during surgery, doctors recommend that 3D printing be used to create a model including the tumor, aorta, and adjacent parts in vitro before surgery for intraoperative reference.

Clinical results show that the 3D model group has shorter operation time, less intraoperative bleeding and postoperative drainage than the non-3D model group, improves surgical accuracy, shortens operation time, and achieves better surgical results.

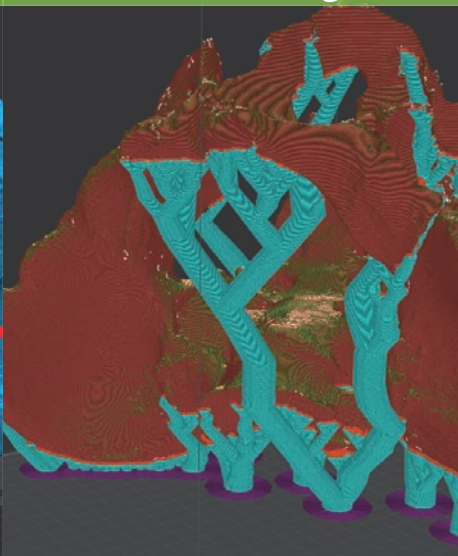
## Other surgeries

Medical information visualization, using digital technology to help individualize, precise, and minimally invasive clinical care.

### Model design



### Model slicing



### 3D printing model

