



SMART VAR HEALTHCARE SUMMIT





3D Technologies in Healthcare

Introducing ScanSource 3D

- 3D printing & scanning industries are growing at 25%+ CAGR
- One of the fastest growing 3D markets is healthcare
- ScanSource has formed a separate business unit, ScanSource 3D to help grow the 3D business in healthcare and other markets
- ScanSource 3D was founded Aug. 2013.
 - Trained sales and technical teams, inside and field support
 - Website, educational materials, business and marketing plans in place
 - Printer and Scanner vendor relationships established
- Excited today to introduce you to 3D Systems and Artec, premier ScanSource 3D vendors for 3D applications in healthcare

Introducing 3D Systems and Artec

3D Systems

Artec

- Founders of 3D Printing
- Broadest line of 3D technology
- Pioneers in developing new solutions and 3D markets

- Leading provider of hand held 3D scanners
- Excellent performance & value
- Perfect for healthcare applications

Artec Group Inc

3D Scanning in Healthcare

Company Overview

- Created in 2007 and began R&D
- Started selling in 2009
- Became profitable within 6 months
- 110 employees in 3 offices around the world
- Offices in Moscow, California and HQ in Luxembourg

What is a 3D Scanner?

- a device that analyzes a real-world object or environment to collect data on its shape and/or color. The collected data can then be used to construct digital three-dimensional models.



How does it work?

- A light pattern is projected onto the object
- The camera captures and analyzes the deviations of the grid in real time
- As the scanner is taken around the object, more of it appears on the screen.

How is 3D Scanning used?

- Our customers can be divided into 3 categories
 1. “The Arts”
 2. “Industry”
 3. “Medicine”

Applications

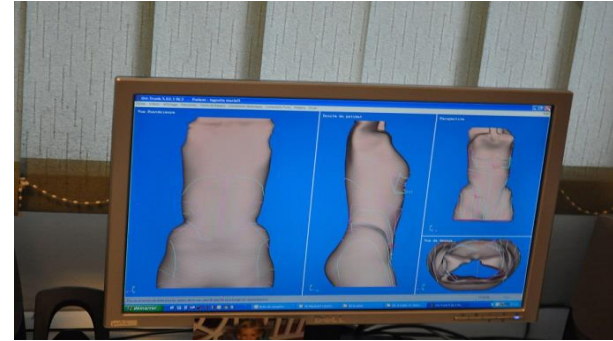
- The “Arts” include:
 - Heritage Preservation
 - Virtual Museums
 - Graphic Design & Animation
 - Special Effects
 - Archeology & Architecture
- “Industry” includes:
 - Prototyping
 - Reverse Engineering
 - Quality Control

“Medicine” in detail

- Scanners are used in a variety of medical sub-specialties
 - Orthopedics and Prosthetics
 - Burn Units
 - Dermatology
 - Oncology
 - Medical Research
 - Maxillo-facial surgery
 - Dentistry
 - Plastic Surgery
 - Forensics

Orthopedics Creating Custom Braces

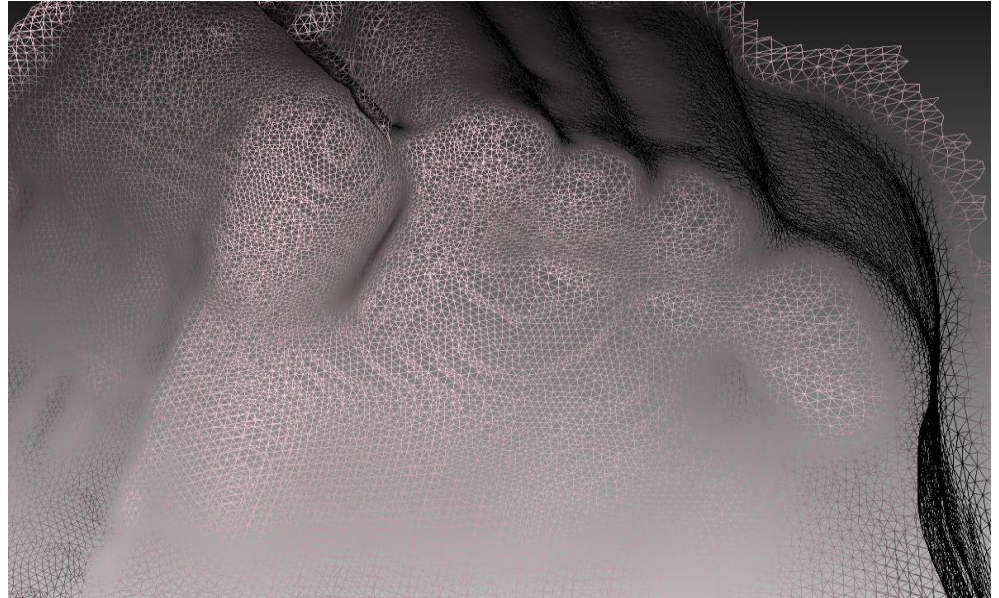
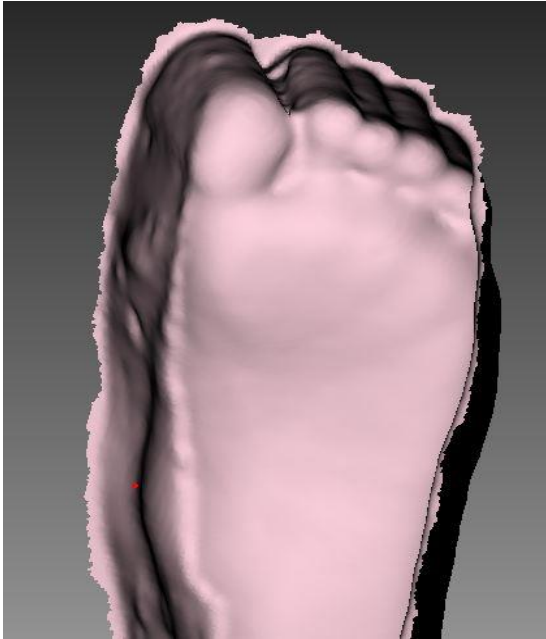
Artec 3D
scanners



Orthopedics

Creating Insoles

Artec 3D
scanners



Orthopedics

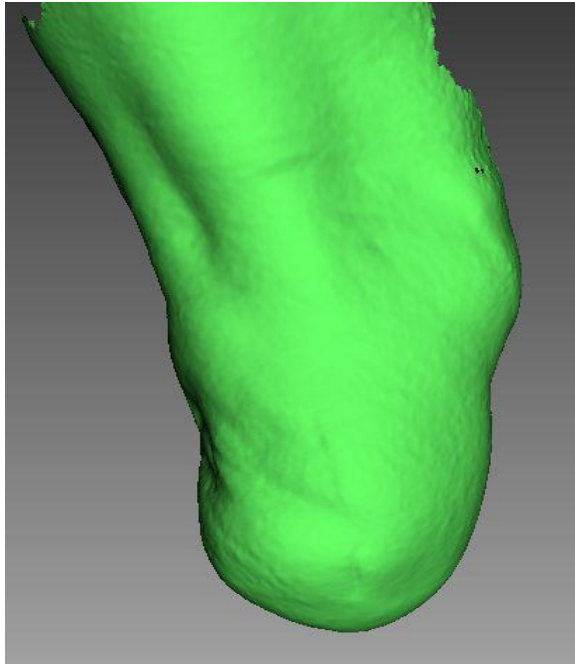
Creating Products for Disabled

Artec 3D
scanners



Prosthetics

Creating Limb Prosthetics



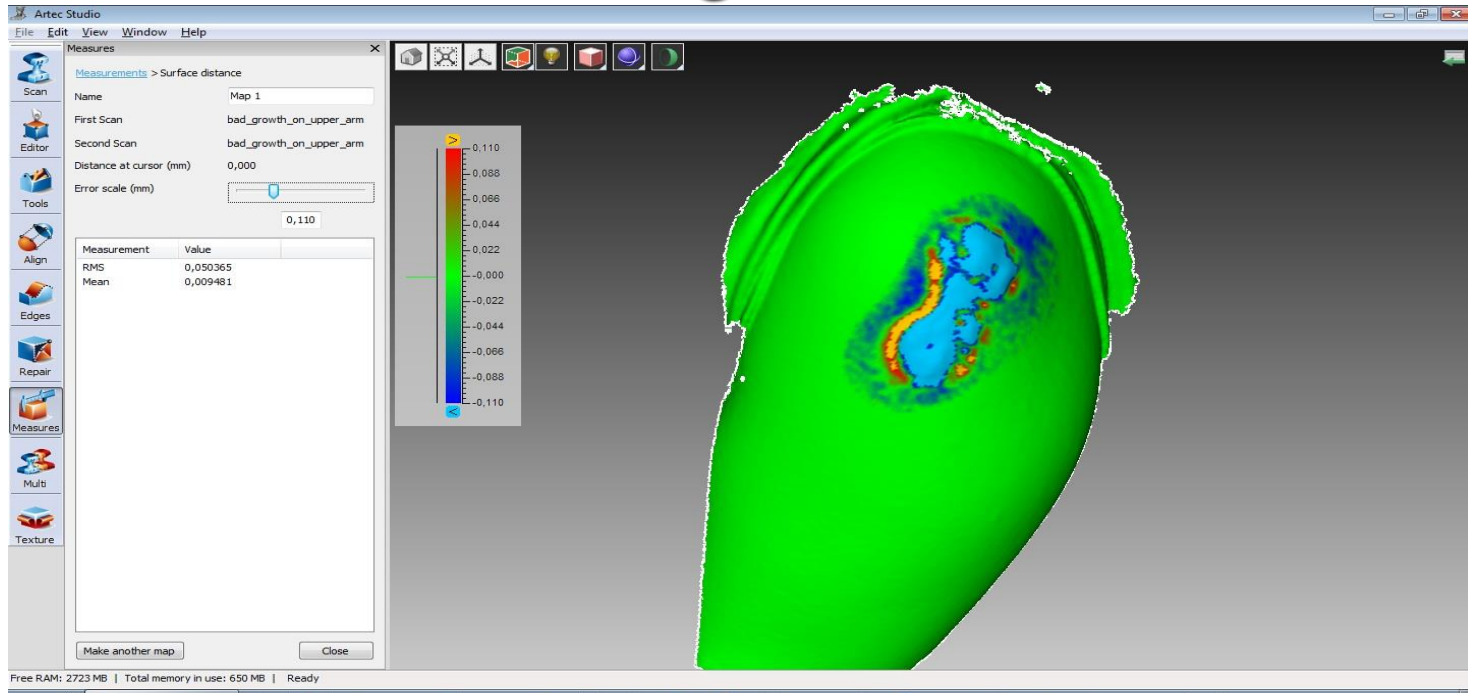
Burn Units

Creating Burn Masks

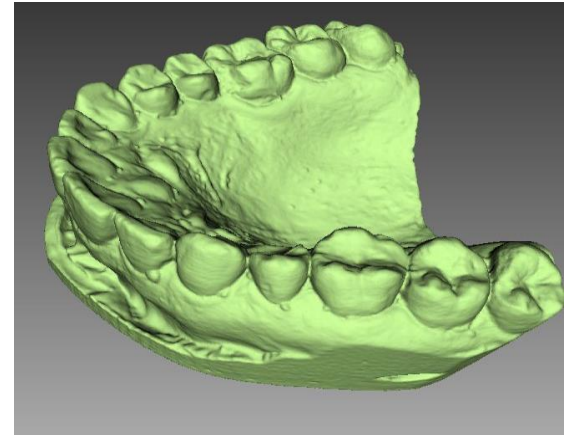


Dermatology/Oncology

Measuring Bad Growth



Maxillo-facial surgery/Dentistry





Additive Manufacturing for Healthcare



MANUFACTURING *THE* FUTURE

Sample Medical Customers

stryker[®]

POREX

 **DePuy**
a Johnson & Johnson company

 **SYNTHES**[®]

 **NAVY MEDICINE**
World Class Care...Anytime, Anywhere



**Pro
Precision
Guides** 

GPI Anatomicals.
The Experts in Anatomical Models

U.S. AIR FORCE

MedCAD[®]

BIOMET[®]

 **WALTER REED**
ARMY MEDICAL CENTER

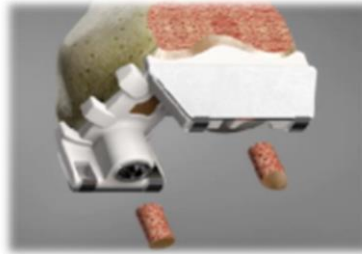
osteo  **symbionics**[™]

 **cartis**
centre for applied reconstructive technologies in surgery

MEDICAL[®]
MODELING
The Tactile Imaging Solutions Company[™]

SAWBONES

Key Healthcare applications



- **Custom Hearing Aids**
- **Orthopedics**
- **Dental Prosthetics**
- **Orthodontics**



It is likely these four applications produce more patient specific custom medical devices per day than all the industrial “RP” machines in the world combined

Hearing Aid types

500 million people worldwide are hearing impaired

BTE -- Behind the Ear



IC -- In the Canal



ITE -- In the Ear



CIC -- Completely in the Canal



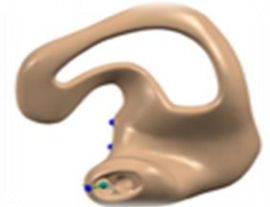
Digital Design Process



Impression



Scan Impression
(1-2 min/shell)



3D Software
Manipulation
(4-8 min/shell)

Rapid Manufacturing Process



Shell Production



Complete and finish



Final Product



Hearing Aid Digital method benefits

- Better fit results in less returns and better audio
- Easy reproduction for lost hearing aids
- Faster with less skilled labor
- Better logistics (digital file & identification tags)
- Improved customer satisfaction
- 10% to 15% lower return rates

Digital Dental - Applications



Technology Driving Digital Dentistry



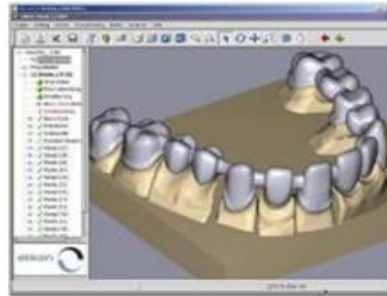
Crowns and bridges



Dental implants



Traditional manufacturing



CAD/CAM prosthetics



Metals



Ceramics

Traditional Subtractive Dental Manufacturing

- Start with a big block
 - Large amount of waste



- High detail means longer milling times
- Geometry Limitations

Orthodontics -- Align Technologies

- SLA Systems used to produce models
- Aligners thermoformed on models
- More than 17 million models in 2012 (80,000+ per day)*



*Align 2012 Financials

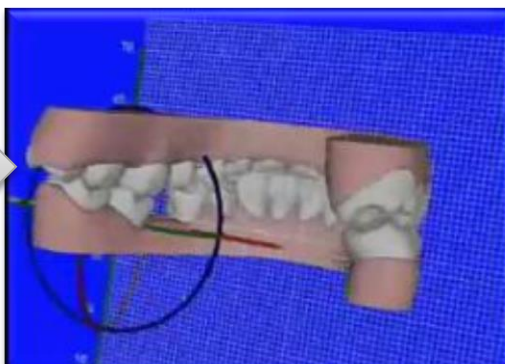


invisalign®

Orthodontics– Align Technologies



Impression or intraoral scan taken



X-Ray scanned into software



Thermoformed into Aligners



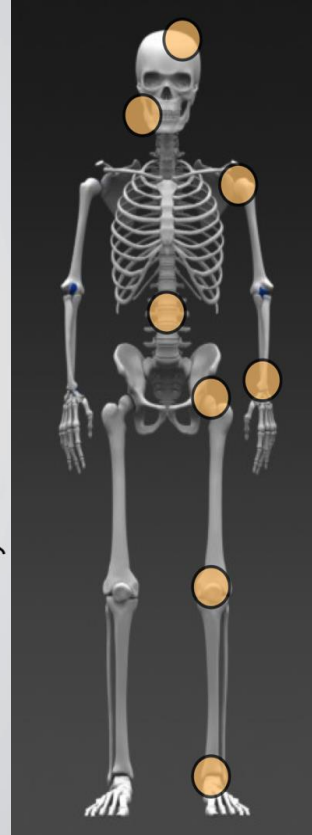
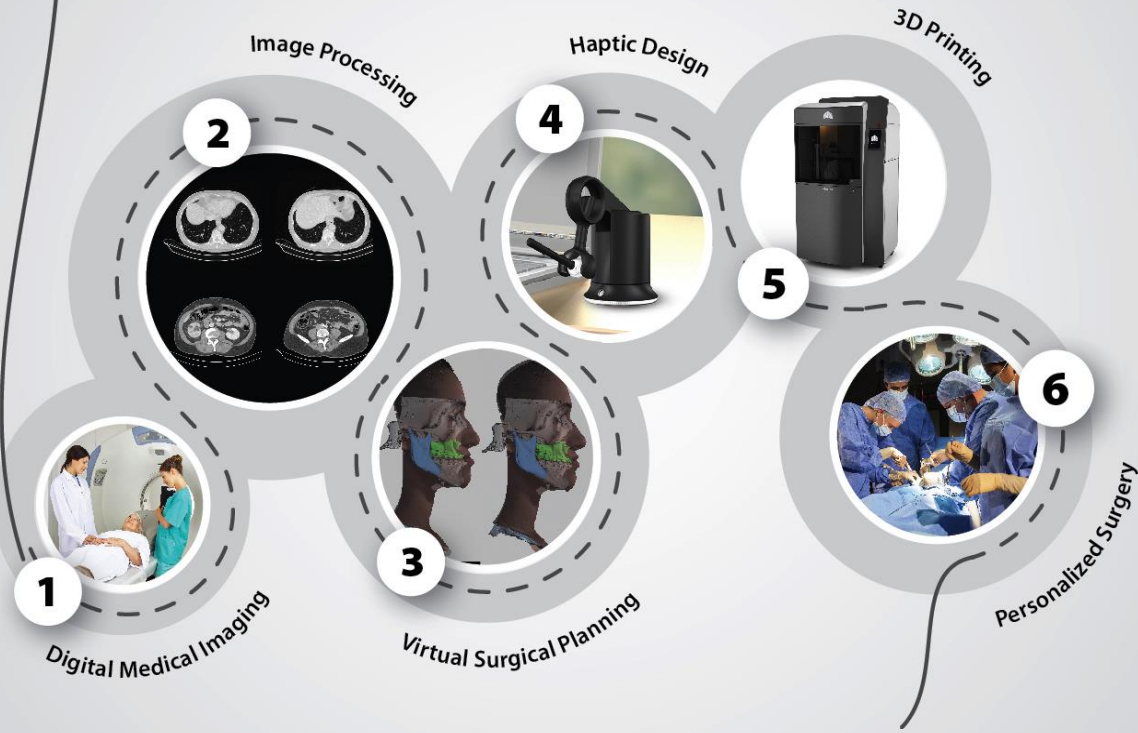
3D Printed using SLA Technology

Part Criteria -- Detail

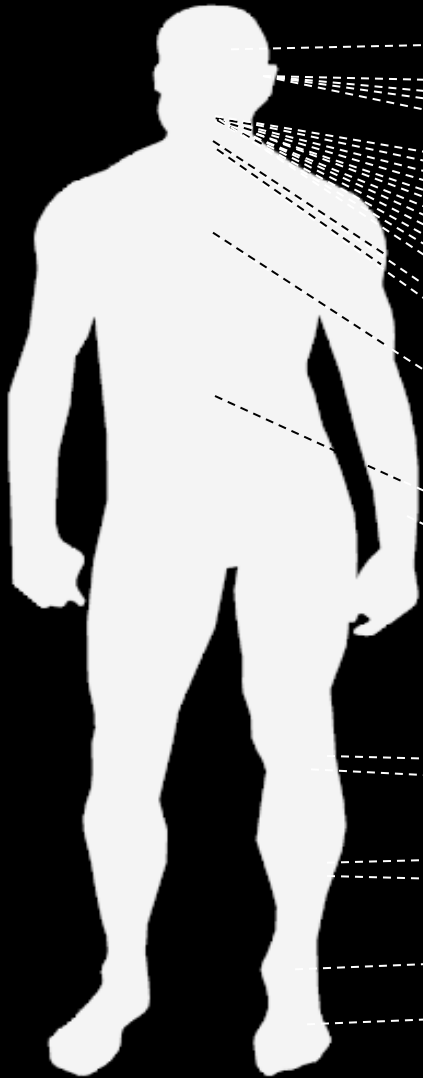


DIGITAL THREAD™ -

Virtual Surgical Planning (VSP®)



Anatomy of Medical Applications



Engineered Skull Plates - ISO-10993 – 140MP

ITE – Hearing Aid –

BTE – Hearing Aid –

Hearing Protection

Custom Audio & Communications

Cleft Palate Correction

Prosthodontics

Orthodontics – Clear Aligner Vac. Forming

Orthodontics – Bracket Fixturing

Orthodontics – bracket casting

Mouth guard

Sacrificial Patterns – Denture Substructures

Chair side full Digital Crown

Dentures

Implant Drill Guide

PrePrep Guide

Temporary Crowns

Custom Neck Brace

Neck implant – Spinal Cage

Heart Valve place - Preoperative tuning

Orthopedic Braces

Fracture – Engineered Cast

Implant Sacrificial Pattern

Implant Instrumentation

Prosthetic Limbs

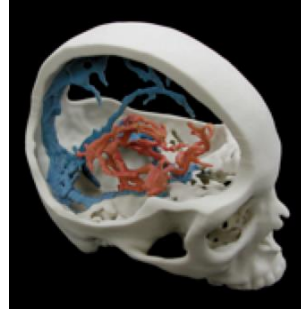
Prosthetic Fairings

Custom Orthotics

Dynamic Ankle Foot Orthosis

PERSONALIZED SURGERY

ANATOMICAL MODELING



PERSONALIZED SURGERY

GUIDANCE AND CUSTOM DESIGNS



PATIENT-SPECIFIC IMPLANTS



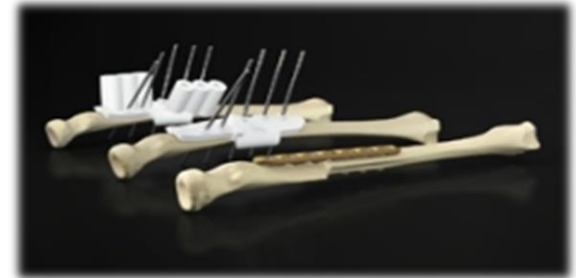
Clinical Models for Pre-Surgical Planning

- **Surgical planning**
 - Informed consent
 - Trauma surgery
 - Congenital deformities
 - Craniofacial reconstruction



Orthopedics – Surgical Guides

- Implant instrumentation, (surgery guides)
 - Reduced sterilization and inventory costs
 - Disposable system delivered in a single pre-sterilized box
 - Minimal instrumentation required
 - Reduced Operating Room and Surgeon time
 - Better Fit, minimally invasive, faster recovery



Bespoke Modeling™

- View in 3D
- Print 3D color models
- Save Time
- Enhance Communication

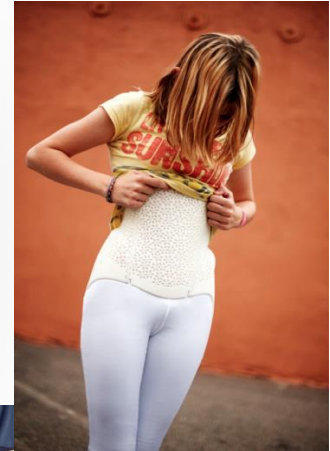


Bespoke Modeling

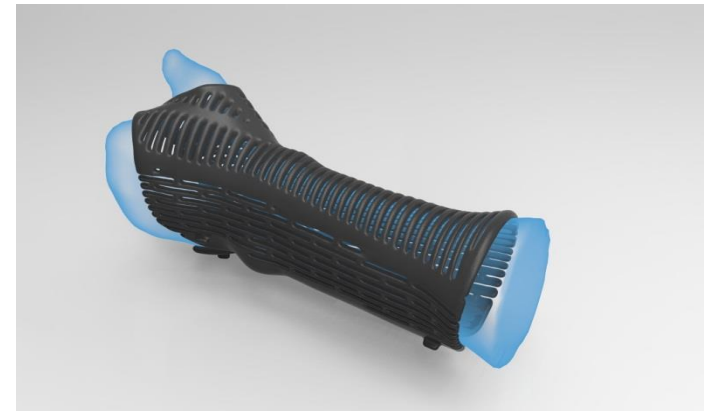
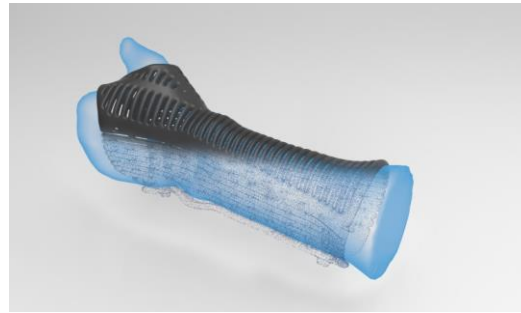
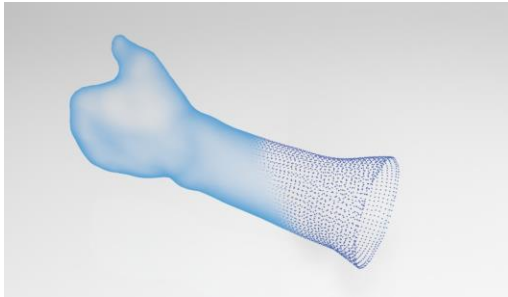


BESPOKE BRACING

SCOLIOSIS, HAND & WRIST



Scan. Design. Print.

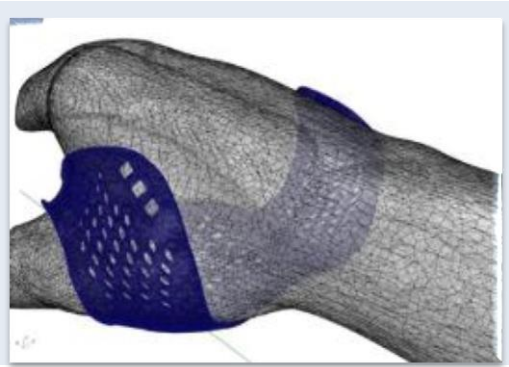


Orthopedic – Digital Hand Brace

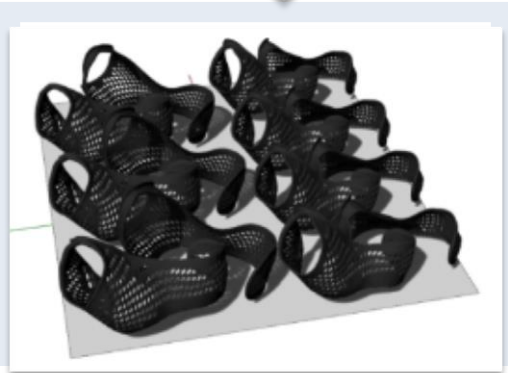
Scan



Design



Build



Enjoy



Traditional Hand Braces

Current orthopedic hand/wrist braces are bulky, uncomfortable, unattractive & “one-size fits all”.







Orthopedic--Hand Braces



Scoliosis Bracing



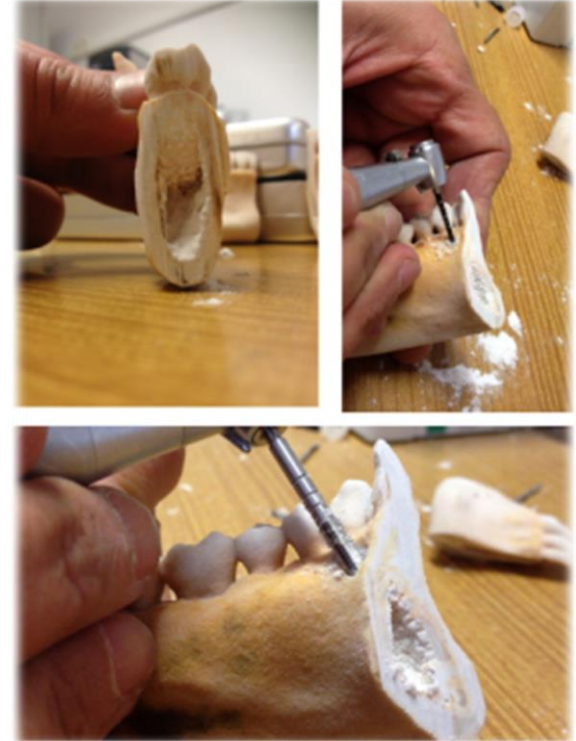
Orthopedics

- Braces / Casts (SLS)
 - Fracture
 - Artificial limb cladding



Custom Device Manufacturers

- Models can be sawed and drilled, exhibiting properties similar to real bone
 - Reduction in Cadaver cost and logistics
 - More hands on training
 - Duplicate sample cases thousands of times
 - Surgeon marketing
 - Trade show practice samples



**Interested in learning more about
becoming a 3D reseller?**

Send email to 3Dsales@scancource.com



rick.jelesky@scancource.com



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