

# 3D LIFEPRINTS

## OVERVIEW





# 3D LIFEPRINTS “LIFEARM”

- 3D LifePrints “LifeArm” is a **functional 3D printed** trans-radial prosthetic device
- It has been developed over a period of 3 years by a consortium of **international and local engineers, medical clinicians and prosthetic fitters**, and field tested in developing countries
- It is entirely designed to **be fit for purpose** for amputees in the developing nations where it will be manufactured and used in **challenging environmental conditions**
- We have been providing our product at no cost across **multiple developing country patients**





# THE LIFEARM - HIGH LEVEL OVERVIEW

## MANUFACTURING TIME

Device can be ready for patient within 24 hours of receiving instructions from prosthetist

## COST

All material cost is <\$50 USD

## DEVICE AESTHETICS & APPEARANCE

The device is indistinguishable from an actual human hand at <10 meters. The device has been subjected to patient based focus groups and declared acceptable by those groups

## MAINTENANCE

Maintainable easily and locally

## LOGISTICS

All parts apart from 3D printing filament can be acquired locally

## STANDARDISATION

4 Standard sizes. Compatible with current sockets. Functional actuation system follows global standardisation methods. Maintainable easily and locally

## CUSTOMISATION

Using mobile 3D scanners. Comfortable for prolonged use. Functionality to meet requirements of end user

## MATERIALS

ISO medically certified, UV / Heat / Humidity resistant in 10 skin tones, extremely durable. Can pick up a 10kg object

## EQUIPMENT

Manufactured on mobile, low cost (<\$3K USD) 3D printers that can withstand power fluctuations & outages

## CERTIFICATION

Future certification to comply with EU Council Directive 93/42/EEC

## AUTOMATION

Designed for optimal efficiency using software from scan to finished model



# THE LIFEARM – BREAKDOWN



3D PRINTED  
SKIN  
COLOURED  
FLEXIBLE  
HAND

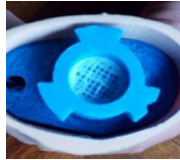


FISHING  
WIRE FOR  
FINGERS

3D PRINTED  
RIGID INSERT



3D PRINTED  
WRIST LOCK



3D PRINTED BESPOKE  
SOCKET



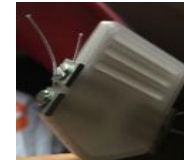
3D PRINTED  
THERMO-  
FORMED  
CUFF



3D PRINTED  
CUFF BUCKLE



3D PRINTED  
WIRE  
TENSIONER



SCREWS FOR  
TENSIONING

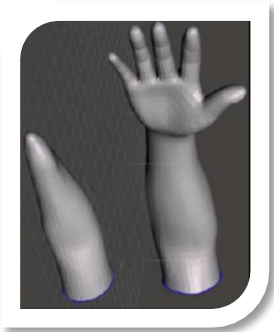
3D PRINTED  
BACK BUCKLE



WEBBING  
FOR STRAPS



# THE LIFEARM – THE MANUFACTURING PROCESS



3D scans are taken of patient



Hand model internals are constructed



Socket 3D model is created



Hand 3D model is created



Product Testing Starts



Final 3D printed LifeArm





Harness actuation system is made



LifeArm is 3D printed



# THE LIFEARM – COMPARISON WITH CURRENTLY AVAILABLE DEVELOPING WORLD PRODUCTS

	<b>3DLP 3D printed upper body prosthetic</b> 	<b>Comparable developing world upper body prosthetic</b> 
<b>MATERIAL</b>	3D printing plastic material	Polypropylene plastic
<b>COST</b>	Low – <\$150 USD	Medium – ~\$500 USD
<b>AESTHETICS</b>	High	Low
<b>MAINTAINABILITY</b>	High	High
<b>LOCAL AVAILABILITY OF MATERIALS/PARTS</b>	Low – 3D print material comes from overseas	Low – Polypropylene comes from overseas
<b>LEVEL OF STANDARDISATION</b>	High	High
<b>TIME TO MANUFACTURE</b>	2 days	1 week
<b>CUSTOMISATION METHOD</b>	3D Scanning – simple	Plaster of paris - complex
<b>WEIGHT BEARING STRENGTH</b>	Medium	High