

# Universal Display



SUSTAINABILITY

# 'GREEN SUSTAINABLE FASHION MANNEQUINS'

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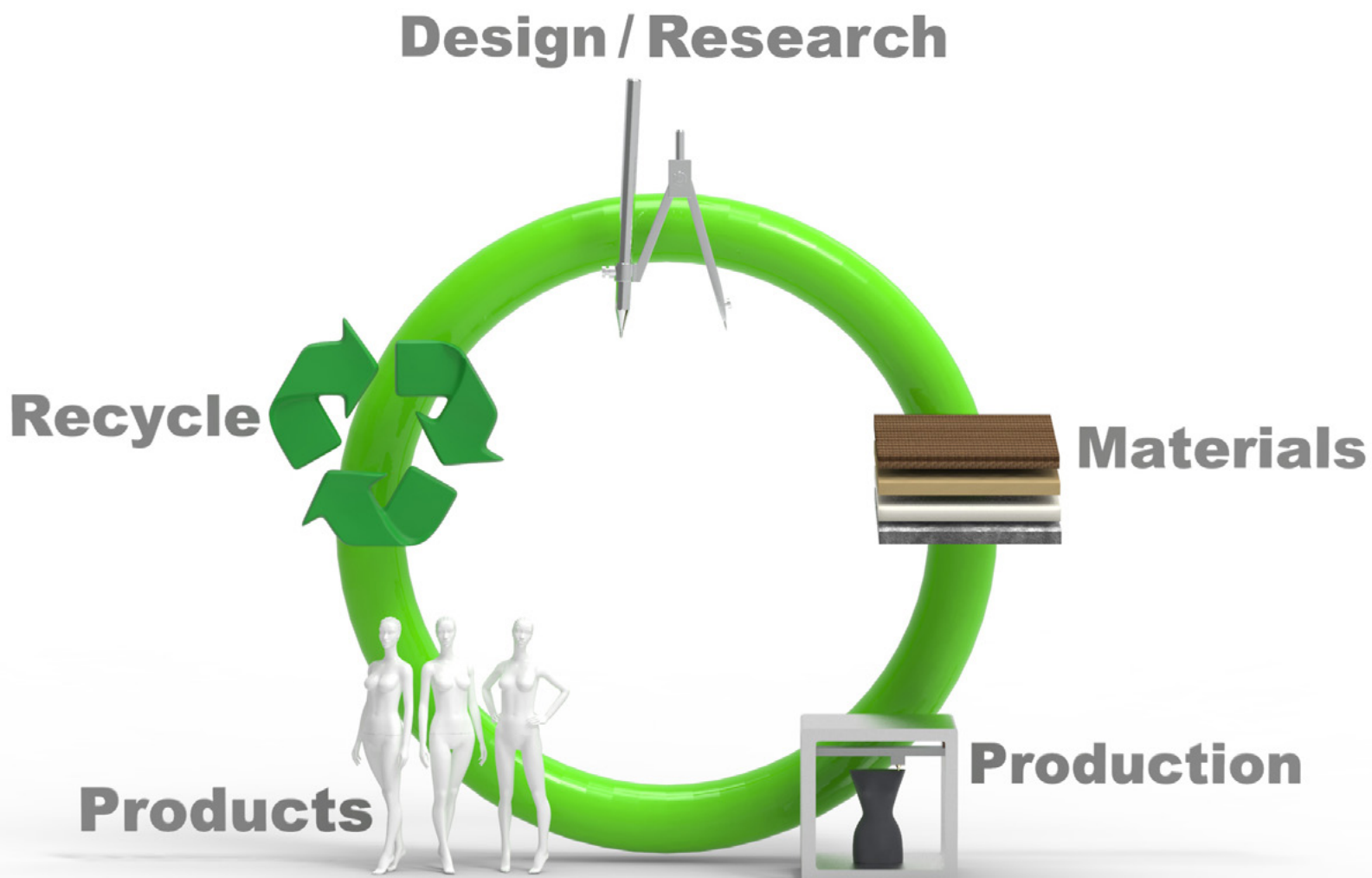
All of us at Universal Display, probably like you, have family & friends around the world who, like us, are feeling the impact of increasingly concerning negative environmental changes. We are conscious that we wish to leave this planet in the same, if not a better, condition than in which we inherited it.

We love working with you and creating amazing products. Now more than ever we have to be mindful of our path to creation and be sure that what we are offering you is truly sustainable. This is why over the last few years we have accelerated our sustainability drive. We are constantly searching and experimenting with new materials and processes.

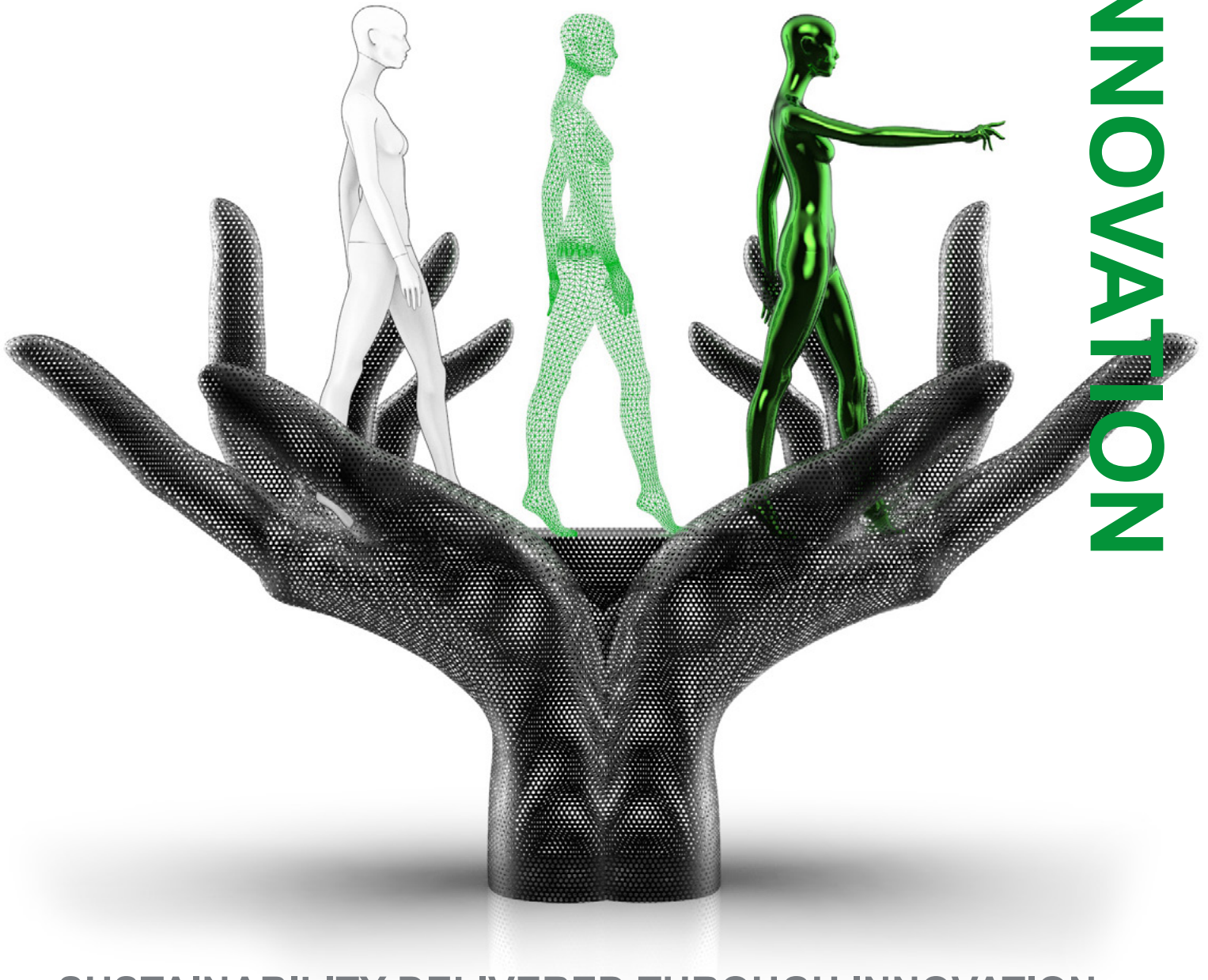
While we acknowledge that we're not yet where we aspire to be, we're steadfast on our journey toward sustainability, fueled by optimism and determination

## SO HOW ARE WE GOING TO DO THIS?

Design & research runs through everything we do, our products, materials and production. We have a circular process where all the stages inform and link to each other. We are now even more aware that the end life of products and how our clients manage these is of great importance and we can help you.



# INNOVATION



## SUSTAINABILITY DELIVERED THROUGH INNOVATION

In recent years, we've undergone a significant transformation in our workflow. We've transitioned from traditional analog methods of creation to a more efficient and dynamic digital approach. Our process now involves digitally sculpting products for clients, offering outputs that can be reviewed in a range of digital formats and easily edited as needed.

### SO HOW DOES THIS HELP SUSTAINABILITY?

With the transition to digital content, clients can review files in various formats such as PDF, AR, and VR. This significantly reduces the need for clients to travel to view the product initially, if necessary at all. Once the final product is approved, design files can be digitally expedited to our manufacturing facility within an hour. In contrast to traditional methods, which involved creating a master using materials like clay and resin and then shipping it to our manufacturing base by sea or air for molding, the digital format streamlines the process. It minimizes shipping and packaging requirements as digital files are locally 3D printed to produce a master for production.

In summary, these new methods are not only swift but also substantially diminish the demand for raw materials, shipping, and packaging materials.

# WHAT DO WE OFFER ?

Mannequins have undergone a material transformation, over the years, transitioning from plaster to papier-mâché. In the 1960s, fibreglass gained prominence for its lightweight and easy fabrication. However, from the 1970s to the 1990s, it became evident that fibreglass, being oil-based, had unsustainable and undesirable characteristics.

In the last decade, we actively sought alternative materials to enhance our product offerings by replacing fibreglass. Looking ahead, we've made a significant decision to discontinue the use of fibreglass in manufacturing our mannequins, forms, accessory pieces and props. Instead, we will embrace GRS certified recycled PET eco fabric as a reinforcement substitute, replacing the traditional fibreglass mat. The PET mat will be securely bound with bio-resin derived from discarded corn waste, making it a more sustainable choice. We will also continue to manufacture in FSC certified papier-mâché & raffia and PU.

This innovative approach not only preserves the favourable qualities of fibreglass—such as being lightweight and exceptionally strong—but also integrates sustainability. The recycled PET is sourced from 100% used water bottles, aligning with our commitment to environmentally friendly practices.

When comparing ABS and PET, it's evident that PET offers significant advantages. Unlike ABS, PET can be easily processed using traditional mould and production methods, enabling the manufacturing of a diverse range of products without the need for expensive metal moulds. PET is particularly well-suited for short-run production, eliminating the substantial investment required by ABS.

Should our message resonate with your values and your company's dedication to a sustainable future, we would be happy to share more information with you.

This can be done either through an in-person meeting or a virtual call, whichever is more convenient for you.



## SCOPE CERTIFICATE

Scope Certificate Number: \*\*-\*\*\*\*\*

IDFL declares that

\*\*\*\*\* \*\*\*\*\* **CORPORATION - \*\*\*\*\***  
**FACTORY**

LICENCE NUMBER 00\*\*\*\*\*

\*\*\*\*\*  
Taiwan

has been inspected and assessed according to the

**Global Recycled Standard (GRS)**  
- Version 4.0 -

and that products of the categories as mentioned below (and further specified in the appendix) conform with this standard.

Product Categories and Details:

**Reference Products Appendix**

Processing steps / activities carried out under the responsibility of the above-mentioned company for the certified products:

**Trading, Packing, Exporting, Importing, Weaving, Knitting**

This Certificate is valid until: \*\* \*\*\*, 2021

Place and Date of Issue

Taipei, \*\* \*\*\*, 2020

Stamp of Issuing Body

IDFL License No: GRS-IDFL-\*\*

  
Wilford Lieber, CEO

IDFL Laboratory and Institute  
4F. No. 163 Wun Hua Rd. Sec. 2  
Banqiao District, New Taipei City



This Certificate of Compliance provides no proof that any goods delivered by its holder are Global Recycled Standard (GRS) certified. Proof of Global Recycled Standard (GRS) certification of goods delivered is provided by a valid Transaction Certificate (TC) covering them. The issuing body can withdraw this certificate before it expires if the declared compliance is no longer guaranteed.

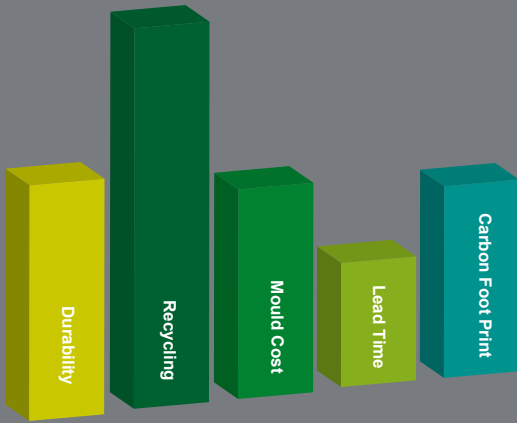
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## SO WHAT ARE THE ALTERNATIVE MATERIALS?

We offer a diverse range of materials, the following are the main ones we offer:

### BIO RESIN

One of the big advantages of using Bio resin is that legacy moulds can be used to produce existing mannequin ranges at low cost, there is no minimum order quantity. The below shows various sustainable natural fibres that can be added into the bio-resin to reinforce it.



Bio-Based PDO (1,3 Propanediol) is a pure, petroleum-free derived diol, 100% sustainably and renewable sourced. It is used in a range of industrial applications including polymers, functional fluids. polyurethanes are used globally in coatings, inks, and resin applications. Good recycling option re-purposed as a construction infill. Open-Loop Cycle

### SUSTAINABLE ADDITIVE FIBRES FOR BIO RESIN



Ramie

Flax

Raffia

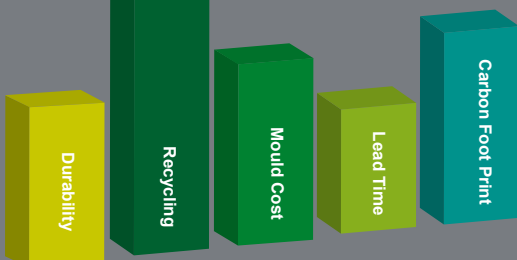
Raffia +  
Translucent Resin

Cork

Bamboo

### RAFFIA AND RICE PASTE

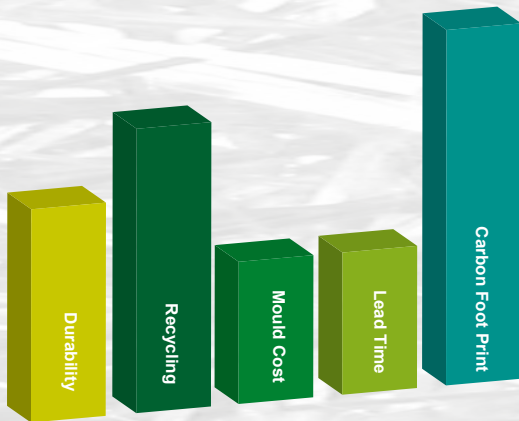
Rice and raffia have been used for thousands of years for construction. The raffia can be covered in cork, fabric or paper which can then be sprayed with water based paints if required. Raffia and rice paste have good recycling options. Open-Loop Cycle



## GRP GLASS REINFORCED PLASTIC

This material has been around since the 1940's, GRP normally consists of a Polyester Resin and Glass Reinforcement such as a chopped strand mat. Mannequins have been constructed in this material for many years, this is primarily due to its strong, light and durable properties.

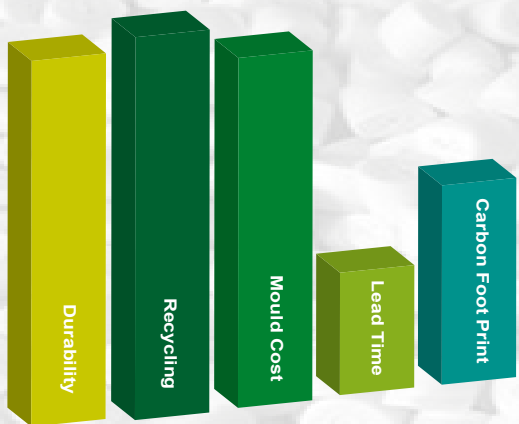
GRP is good for high or low quantities and special products. Good 100 % recycling option re-purposed as a construction infill. It is worth noting that Bio resin has become a good viable alternative to Polyester resin. Open-Loop Cycle



## ABS ACRYLONITRILE BUTADIENE STYRENE

There is a high mould cost with ABS, with a minimum order of 150 units. ABS is durable and has recycling options. When ABS is heated it melts, allowing it to be extruded. This means that ABS is reusable and can be recycled. A lot of ABS products are made from recycled material, or have a percentage of recycled material in them.

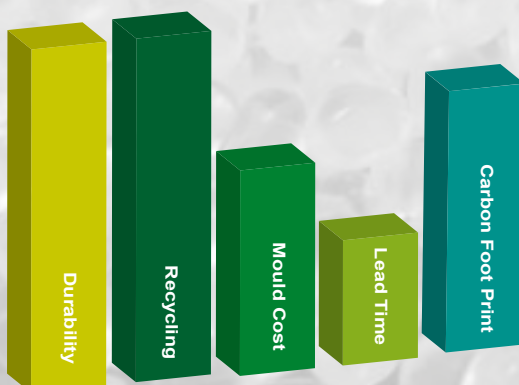
ABS is fairly harmless, there are no known carcinogens in this material and no related health effects have been found from exposure to this plastic. This makes it a safe plastic to use; this is another reason why ABS is so commonly used. Open-loop Cycle. Also see 3D Printing



## PU THERMOPLASTIC POLYURETHANES (TPU)

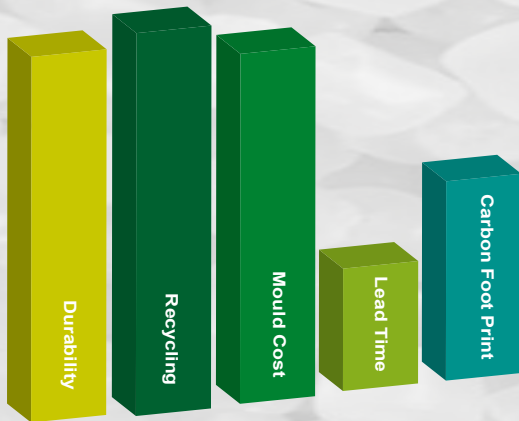
Thermoplastic Polyurethane, TPU can be processed easily via conventional methods like injection moulding, extrusion, blow and compression moulding. PU is easily moulded into shapes with a good life span and has the possibility to be recycled Open-Loop.

Things to consider are the moderately priced tooling of the moulds. TPU is highly durable and has a long life span. Polyurethane is recycled in two primary ways: mechanical recycling, in which the material is reused in its polymer form, and chemical recycling that takes the material back its various chemical constituents.



## PE POLYETHYLENE

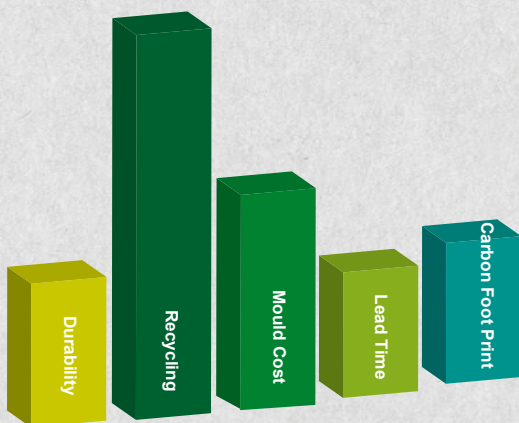
Polyethylene is a thermoplastic polymer with a variable crystalline structure and a vast range of applications depending on the particular type. It is one of the most widely produced plastics in the world. PE has high mould cost and is therefore only recommended for high quantities. The durability is very good, PE has limited possibilities to be recycled. There are a number of species of bacteria and animals that are able to degrade polyethylene. Open-Loop



## PAPER

Paper has been used to create products since 200 AD in China, papier-mâché came to Europe in 1725, it wasn't until the mid-19th Century it became popular in France to make Mannequins. 100% Post-Consumer or FSC Paper, is biodegradable but treated correctly can have longevity.

Being paper derived it has low toxicity and is compostable, if it has not been coated in paint. Paper products are more fragile than plastic forms and can be easily damaged if dropped or carelessly handled. Open-Loop & Closed-loop recycling.



## 3D PRINTS

Good for prototypes, bespoke items and short runs. Filaments can now be used that contain materials of a recycled origin, including wood.

**ABS Acrylonitrile Butadiene Styrene** Is extruded through a print-head to print products, this process is good for samples and low volume pieces. ABS can be reused and recycled Open-Loop

**PLA polyactic acid**, PLA is a bioplastic derived from plant-based sources. PLA is biodegradable recyclable Open-Loop

**SLA Stereolithography** is a common rapid manufacturing and rapid prototyping technology for producing parts with high accuracy and good surface finish. Stereolithography (SLA) resins are liquid UV-curable photopolymers used in this process. Limited options to recycle.



## MANUFACTURE

Our products are manufactured across multiple locations worldwide, with our main sites situated in the UK and China. In London, our facilities include design studios, renovation workshops, papier-mâché bust production, and warehouses.

Our production in China was established in 2006 and currently comprises a team of 14 office staff and 200 factory workers.

As part of our commitment to sustainability, all vehicles in our company fleet are either hybrid or fully electric, and our plants operate solely on renewable energy sources.

## PRODUCING MATERIALS

All our materials are specially selected from leading manufacturers, we only use materials that are of the highest standard from the bio resins we use to the FSC wood content in our bust forms.

## WASTE

All the waste from the manufacture of our products is disposed of by registered waste collectors. In the UK our provider operates a documented management system that fully complies with the requirements of ISO9001 and ISO14001. In China our spray booths and lamination area have ultra violet filaments to reduce pollution and waste entering the atmosphere. Our China factory has its own water treatment plant, all other (China) waste is disposed of by registered waste collectors.

## WORKING CONDITIONS

We take the health and safety of our staff very seriously. In the UK and China we are audited by external independent companies to make sure we comply with legislation. All staff have access to PPE when ever they need it. Customers can possibly get a cheaper product, but in doing so they run the risk of exposing themselves to manufacturers where conditions are far from satisfactory and in some cases are just plain dangerous. We proud of our facilities and welcome customers to visit to see first hand.

## PAINT

Water-based, options like anti-scratch are also a popular choice. We work with companies that have a commitment to develop more environmentally friendly coatings.

## CERTIFICATION

Our London studios and warehouse are externally audited on a yearly basis for Health and Safety, to make sure we are compliant with legislation and we are using the best practice.

We have used external auditors for the last 10 years.

Our China facility has been audited by internal auditors from:

H&M

Uniqlo

External audits have been carried out by;

Sedex

SGS

Responsabilitas

FSC certificate for Raffia composite

We have passed the above inspections and are still working on ways to improve.

## PRIMARY AND SECONDARY PACKAGING MATERIALS

We have implemented an environmentally friendly means of packaging, reducing 70% of the bubble wrap and foam used.

However, whilst we have the need to reduce the impact on the environment, there is not an adequate replacement for some of the packaging materials used.

It is essential to supply products that are packed well in order to avoid damage.

If products get damaged in transit, sending replacements or having the product returned to us would greatly impact our carbon footprint and is costly to the environment.

## TRANSPORTING THE FINISHED PRODUCTS TO ITS DESTINATION.

Where possible, we try to amalgamate all products so that they can be bulk shipped whether domestically or internationally.

Where possible, we ship goods out on pallets. This makes a considerable saving in time, energy and handling. This also allows us to insure greater control against damages.

For domestic and many European deliveries we use the UK's most sustainable delivery company, whose mission statement is to become the greenest delivery company on this planet. They are building the largest fleet of electrical vehicles in the UK. For deliveries in other worldwide countries, we strive to use companies with the same ethos and who have the greatest green credentials.

We are here to help and can take you through all the shipping and storage options available to help you to determine the best and most sustainable option for your business.



# RENOVATION

**Second life** - to extend the life cycle of our, or someone else's, mannequins, forms, etc we offer a full renovation service. We can take old damaged products, replace broken fittings, supply new parts and spray them to any colour or finish, so they look as good as new.

We can also provide makeup and wigs to your desired design.



## RECYCLING OF FIBREGLASS

Industries have long been seeking the answer of how to dispose of fibreglass in an environmentally conscious way. We can now offer a service that will bulk dispose of your fibreglass mannequins at a modest price.

The major component of glass fibres and resins can be used in the manufacturing of the valuable raw materials required for the kiln-firing of cement. Fibre composites can also be used in the production of cement, taking a 'zero landfill, zero energy' approach. The cement can then be used in the building of roads, schools, hospitals, housing, as well as decorative applications.

Contact us for more Information

## RECYCLING OF PLASTICS

Plastic can be split into two types: thermosets and thermoplastics.

Thermosets are materials that are moulded and then cured into their final forms, and include materials like polyurethane or silicone.

Thermoplastics don't have any curing step, and become pliable or workable after being heated past their melting temperatures. As a result, virtually every type of FDM 3D printer plastic is a thermoplastic.

In theory, most types of thermoplastic can be melted down and recycled, with differing amounts of efficiency and material loss between each type. However, the specific types of plastics processed by recycling facilities can differ significantly worldwide or even among different areas within the same city.

## PLASTIC CLASSIFICATION



PETE

POLYETHYLENE  
TEREPHTHALATE

SOFT DRINK BOTTLES,  
MINERAL WATER,  
FRUIT JUICE  
CONTAINERS &  
COOKING OIL



HDPE

HIGH-DENSITY  
POLYETHYLENE

MILK JUGS,  
CLEANING AGENTS,  
LAUNDRY DETERGENTS,  
YOGURT & BUTTER TUBS  
SHAMPOO BOTTLES,  
SHOWER GEL



PVC

POLYVINYL CHLORIDE

PLASTIC PACKING  
BUBBLE WRAP,  
FOOD WRAPS  
PLUMBING PIPES



LDPE

LOW-DENSITY  
POLYETHYLENE

SHOPPING BAGS,  
CLOTHING, CARPETS,  
HIGH-RESISTANT  
SACKS AND MOST  
WRAPPING



PP

POLYPROPYLENE

FURNITURE,  
LUGGAGE CASES,  
TOYS,  
KETCH UP BOTTLES,  
SYRUP BOTTLES



PS

POLYSTYRENE

COMPACT DISC CASES,  
EGG CARTONS,  
MEAT TRAYS,  
DISPOSABLE PLATES  
AND CUPS



OTHER

ACRYLIC  
POLYCARBONATE  
NYLON, FIBREGLASS

SUNGLASSES,  
IPOD CASE,  
NYLON WATER BOTTLES  
COMPUTER CASES

# CONCLUSION

As evident, there exists a wide array of sustainable materials available for recycling. Our commitment to research and development remains unwavering to ensure that we meet the precise needs and demands of our clients. We take pride in delivering products that truly align with their claims.

While many assert the ability to produce bio-resin mannequins, a closer examination often reveals that the biomass content in these products is minimal.

We stand ready to provide assistance and guidance on selecting materials that can meet your future requirements and budget, whether you run a small boutique needing a few mannequins or a multinational corporation in need of large volumes.

From initial design to manufacturing and shipping, we offer a comprehensive solutions to help you achieve your sustainability objectives.

Our dedication to continual evolution, research and innovation ensures that we consistently identify the optimal options for your business and the well-being of future generations.

## HOW CAN WE HELP YOU?



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