Centre
for Circular
Design

Materials

ual: centre for circular design

Materials

Circularity through material & process innovation

Creating materials, products and clothes (from waste resources) that are able to be used appropriately, reused and then recycled, through existing and new manufacture, production and finishing processes and applications.

Centre
for Circular
Design

Models

ual: centre for circular design

Models

Circularity through rethinking biological, technical, business & social systems

Innovating within and between the biological and technical cycles; extending the way we make, sell and remake products and materials using flows and loops; creating new ways to meet the needs of communities and individuals.

Centre
for Circular
Design

Mindsets

ual: centre for circular design

Mindsets

Circularity through shifting industry, community & individual habits

Using design to challenge, support and steer people who are part of circular economies. An extended role for designers that uses co-design, social design and user-centred design, along with social science insights to affect behaviour change.

Centre
for Circular
Design

Design for Remanufacture

ual: centre for circular design

Design for Remanufacture

When designing for recyclability it's important to ensure the materials are available to be remanufactured into something new at the end of the lifecycle that you are designing for.

Monomaterial. This approach ensures that materials can enter efficient recycling systems - making the sorting process easier and avoiding contamination at the reprocessing or regeneration stage

Disassembly. This approach ensures that materials or products can come apart to enable repair or remanufacture to take place; as well as making the sorting process easier and avoiding contamination at the reprocessing or regeneration stage

Centre
for Circular
Design

Design for Mechanical Recycling

ual: centre for circular design

Design for Mechanical Recycling

With mechanical recycling, materials are shredded so either the pieces can be melted into new products as with plastics, or in the case of textiles, the fibres are respun with virgin fibres to strengthen it.

One of the key aspects of mechanical recycling is the fact that the colour and other properties of the input will be maintain in the output, this therefore requires additional care in the sorting process.

Centre
for Circular
Design

Design for Chemical Recycling

ual: centre for circular design

DfR

Design for Chemical Recycling

Chemical recycling processes are currently emerging which aim to return materials to the same or better quality as virgin materials.

e.g. The Ioncell F process is derived from a viscose process which would usually transform the cellulose in wood into textile fibres; in this case it is engineered to work with the cellulose contained in waste garments made from cotton to achieve a lyocell quality fibre. The process can even be done with cardboard. Other processes exist for synthetic materials.

Centre
for Circular
Design

Design for Bio-Degradation

ual: centre for circular design

Design for Bio-Degradation

Domestic Composting. Products and materials can be part of the biological cycle by being made in such a way that they will naturally decompose back into the soil. With domestic composting this takes place in a garden or allotment where local weather and soil conditions determine speed of bio-degradation.

Industrial Composting. Products and materials can be part of the biological cycle by being made in such a way that they will decompose back into the soil with help from industrial conditions where oxygen, water and temperature is controlled to hasten the speed of bio-degradation.

Centre
for Circular
Design

Design for Keep

ual: centre for circular design

Design for Keep

This strategy is all about designing a material or product in such a way that the user is able to get maximum use and value from it.

Design for...

...**Physical Durability** is designing a material or product with the aim of longevity by giving it maximum strength to resist wear and tear within appropriate specific contexts of use.

...**Emotional Durability** is designing a material or product with the aim of making things that people want to keep for reasons that are often personal and subjective.

...**Aesthetic Durability** is designing a material or product with the aim of longevity by giving pleasure to the user through the specific aim of making it beautiful.

Centre
for Circular
Design

Design for Change

ual: centre for circular design

Design for Change

This strategy is all about designing a material or product to change in some way, therefore eliminating the associated impacts that comes with buying something new.

Design for…

…**Customisation** is designing to enable the modification of a material or product to suit a particular need or desire.

…**Adaptability** is designing to enable the material or product to be modified for a new use or purpose.

…**Multifunction** is designing to enable the material or product to have or fulfil several functions.

…**Modularity** is designing a material or product with a series of independent units that can be combined in a number of ways, in order to create a diversity of options.

Centre
for Circular
Design

Design for Care

ual: centre for circular design

Design for Care

Design for...
...Washability is designing to prolong the life of materials or products we need them to age well; this can be done by redesigning new parts that usually get dirty fast.
...Repairability is designing to enable tears to be repaired easily, gracefully and stylishly.

...Rentability is designing to materials and products for multiple users over a period of time.

...Swappability is designing to support the practice of swapping goods with other users.

...Returnability is designing materials and products that can be more easily returned to the manufacturer or retailer.