

# CIRCULAR REUSE OF DISPOSABLE VAPES

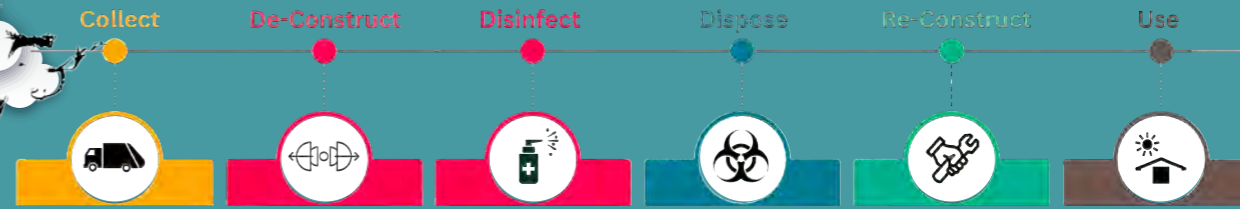
Disposable vapes are a **growing environmental hazard**. With a short lifespan and improper disposal, the devices significantly contribute to **e-waste and plastic pollution**.

When discarded in landfills, vapes pose **considerable risks to ecosystems and human health**, with harmful chemicals leaching into the environment.

Cities like Melbourne and Sydney have already recognised the issue by funding **vape collection programs**, focusing on disposal rather than material recovery.

This presents an opportunity in the manufacturing line for the reuse of reclaimed vapes into a sustainable building material.

## PROCESS



### Decontamination:

Collect discarded disposable vapes. Submerge them in a deionized water bath to remove residues and toxins. Dry thoroughly to prepare for shredding.

### Shredding and Reformation:

Extract and shred the polycarbonate components. Process the shredded material into panels, sheets, or other forms for construction purposes.

### Initial Use:

Fabricate UV-stable building materials for external uses such as bus shelters, cladding, or public infrastructure. Leverage Australia's high UV exposure for natural secondary decontamination during the material's outdoor lifecycle.

### Secondary Use:

After years of UV exposure, the materials can be recollected. Recycle the decontaminated polycarbonate into high-quality interior building materials for applications like wall panels, furniture, or fixtures.



## CHALLENGES

**Collection Logistics:** Establishing systems to collect used vapes effectively.

**Initial Decontamination:** Ensuring safe handling and thorough removal of harmful residues.

**Material Durability:** Testing for long-term performance in external applications under intense UV exposure.

**Public Perception:** Educating stakeholders about the safety and sustainability of reused e-waste materials.

- A POLYCARBONATE CASE.
- B FOAM WRAPPING
- C ADHESIVE TAPE
- D ADHESIVE FOAM
- E TUBE SLEEVE
- F FOAM PROTECTOR
- G RUBBER GASKET/SEALS
- H COIL
- I METAL WIRES
- J WIRE INSULATION
- K WICK (CONTAMINATED WITH E-LIQUID)
- L WICK SLEEVE
- M LITHIUM BATTERY
- N CIRCUIT BOARD
- O VENTILATION TUBE
- P USB CASE
- Q ACTIVATOR BUTTON



## RECYCLING BREAKDOWN

## BENEFITS

**WASTE REDUCTION:** Redirects non-biodegradable e-waste from landfills.

**RESOURCE EFFICIENCY:** Extends the lifespan of polycarbonate materials through a two-phase usage cycle.

**UV DECONTAMINATION:** Utilizes natural UV exposure to neutralize residual toxins.

**SUSTAINABILITY:** Promotes a circular economy by designing for eventual recyclability.

## APPLICATION

EXAMPLE OF COLUMN TO BEAM CONNECTIONS BASED ON MIYADAIRU (TRADITIONAL JAPANESE NAILLESS CONSTRUCTION)

