CycleBrick

In collaboration with

Foundation for African Circular Economy

Emergency Architecture and Human Rights

INGENIØRER UDEN GRÆNSER

Engineers without borders

SUSTAINABLE DEVELOPMENT GOALS

3 GOOD HEALTH AND WELL-BEING

8 DECENT WORK AND ECONOMIC GROWTH

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

CycleBrick

Workshop Booklet

A Guide of How to Create Bricks with Plastic Waste

&

Inspiration for applications of the materials

Production Facility

1. An oil barrel is cut in half and a hole is cut in the side.

2. A fire is made in the bottom of the barrel.
   (Biogas is preferred to charcoal/wood)

3. A pot is placed on top of the fire with tiles surrounding it. First off plastic is melted with ½ dl rapeseed oil. Ad additional small amounts of rapeseed oil if the melting process slows down.

4. More plastic and sand are added a little at a time, and mixed well. If the mixture starts smoking take it of the heat.

Temperature

260°C

04 PE-LD

05 PP

30% Plastic

70% Sand

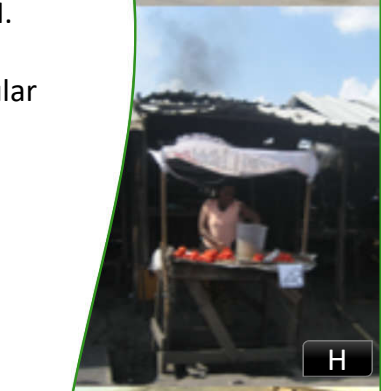
Simple constructions & Furniture

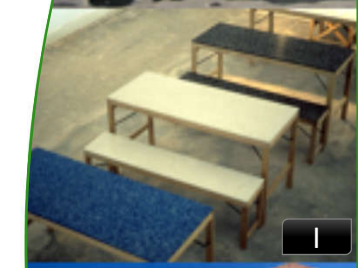
The method of the CycleBrick can besides creating playgrounds be used to create materials for smaller constructions, as the ones shown in picture G and H.

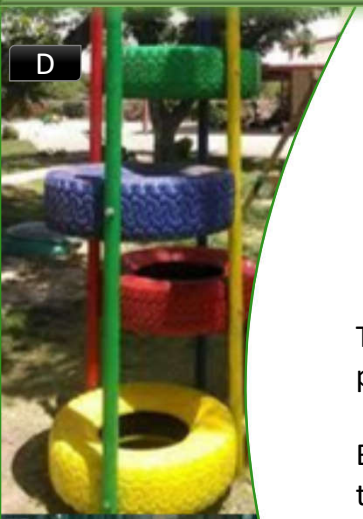
These construction materials can be utilised as regular building materials in smaller constructions and furniture. These can be build with regular methods (nail + hammer, drilling).

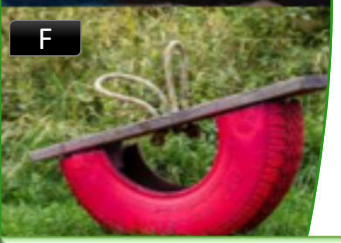
Depending on the type of construction (table, chair, marketplace stand), the thickness of the boards/columns should also here be put into consideration when designing the shapes.

Picture I and J show how plastic boards can be utilised with either wood or plastic columns to create tables and benches.
Same principles can be used for the marketplace stands.









Playgrounds

Make Upcycling of Tires Possible

The CycleBrick method can be used to construct playgrounds in combination with upcycled old tyres.

Boards, columns and bricks made with the methods of the CycleBrick gives a range of opportunities for playgrounds. Furthermore, the playgrounds can be utilised to provide awareness to children about sorting and recycling of waste.

The boards/columns are defined by the moulding shape, which can be made as desired.
Depending on the type of construction (seats for seesaws (picture F), columns for towers (picture D and E) and so on, one should be aware of the thickness when designing the shape.

Shapes

The unique CycleBrick shape makes it possible to build the bricks together without mortar or other additional materials.
The shape can be welded or made in wood as shown in pictures 5, 6 and 7.

The shape needs to be quite precise and robust to handle the pressure, but it can be made with simple tools such as saw, hammer, nails and measuring tape. It is preferred to weld the shapes.

Any shape can be made.
A regular Danish brick shape is shown in pictures 8 and 9.

Moulding

The hot mixture of sand and melted plastic is mixed with a drilling machine and a mixing drill bit, as seen in picture 10. The mixture is transferred into the shape in 2-3 portions and compressed after each portion to remove air and make the brick compact and strong, see pictures 11 and 12.
The excess mixture is removed before the bricks dries/cool down.

The bricks can be taken out of the shapes after approx. two hours.

When producing and moulding the CycleBricks, masks and gloves should be worn at all times.

Make sure no plastic is taken by the wind.
The CycleBricks can be melted and reshaped again at End of Life.


10


11


12


13

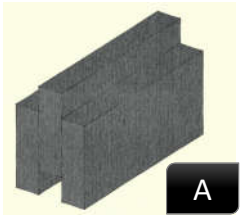
Walls

The CycleBricks are build together simply by placing them on top of each other, see figure C.

The CycleBrick is designed with two layouts, the differences in the designs are the sideway connections.
The simplest one with a straight connection is shown in figure A and the most complicated one, which needs an extra piece for the middle, is shown in figure B.

The CycleBrick can be used to build outdoor toilets, walls and smaller constructions.


Latrine in poor compound of Lusaka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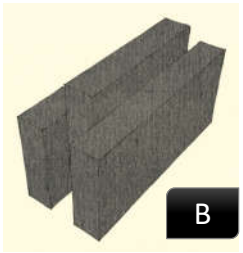
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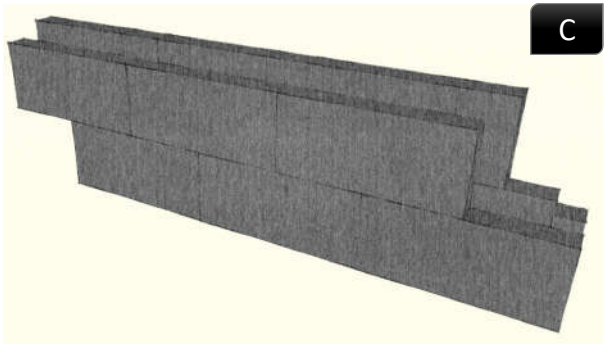
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