RECYCLING FOR REFUGEE HOUSING

BORN & BRED IN UGANDA

KATERINA KALYONCU

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ABSTRACT

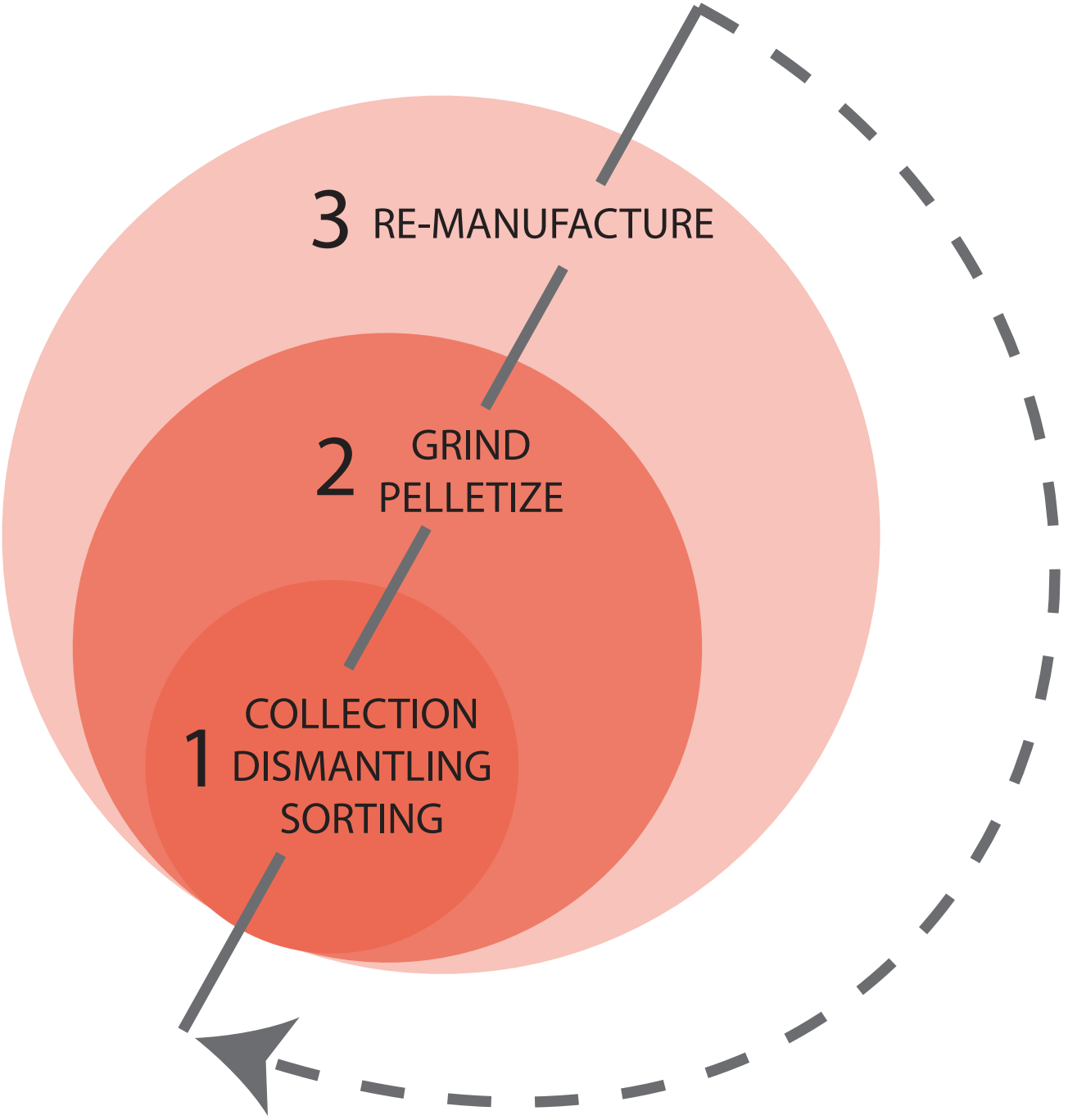
Recycling is now the business that is the rising trade around the world. Uganda has already begun participation in the business by beginning the process of recycling. This handbook explains the steps of the recycling process in Uganda, how the plastic is remanufactured, and what building components and homes that can be constructed with this method.

This method takes advantage of using recycled HDP since it can replace and outlive steel, concrete and wood with better strength and lighter weight. In order to build a refugee house even cheaper, extraneous hardware is removed from the construction.

Taking advantage of folding as a construction method would produce refugee housing that become self-sufficient using recycled plastic panels, rubber seals to connect these panels and only a short amount of screws to keep the sealant in place.

PROCESS

LIFE CYCLE OF PLASTIC IN UGANDA



PROCESS

STEP 1

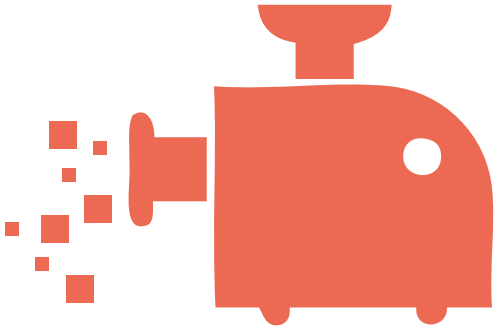
WASTE COLLECTION - DISMANTLING - SORTING

Citizens of Uganda are hired by small companies to search their own cities for plastic. It is the job of these men to gather as much plastic as possible, dismantle them and sort them appropriately. Scavangers are payed about $1 a day and can gather up to 100 lbs per day.

1 SCAVANGER	1 DOLLAR	100 LBS.

PROCESS

STEP 2
GRINDING - PELLETIZING



The companies who pay for for the men to go out and scavange are responsible for cleaning, grinding and/or pelletizing the plastic. This step reforms the plastic appropriately and prepares it for repurposing. One of the biggest companies practicing this in Uganda is the Green World Recycling Company, located in Bugujju Village, Mukono district in central Uganda.

When reaching out to the company, they reported that they sell different kinds of recyled plastic for about 30¢ per lb. Companies that grind and pelletize plastic sell the broken down material to larger companies that then remanufactor the plastic into new products. The Green World Recycling Company sells to many companies throughout Uganda, but their leading trade is with the Nice House of Plastics in Kampala, Uganda.

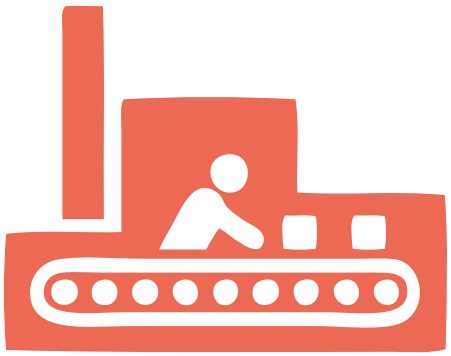
The plastic of HDP Blow Injection has a sturdy property and is plentiful in Uganda. That being said, it is the most effective plastic for building in Uganda.

GREEN WORLD Recycling COMPANY

Located in Mukono Distrcit, Central Uganda

HDP Blow	28¢ per lb.
HDP Blow Injection	31¢ per lb.
PP	25¢ per lb.

PROCESS



STEP 3
MANUFACTURING - USE

The presence of this business taking place in the coutry presents a multitude of posibilites for the Uganda. The Ugandan people have the choice of selling the plastic to other countries, to keep it to themselves, and decide what the plastic may become.

Currently in Uganda, the recycled plastic is being repurposed into household objects such as cups, plates, toothbrushes, and basins. The company of Nice House of Plastics is well known in Uganda for these products. New ideas must be incorporated into existing companies to develop an efficient and cheap building system to help an abundant amount of people in need.

NICE®
HOUSE OF PLASTICS

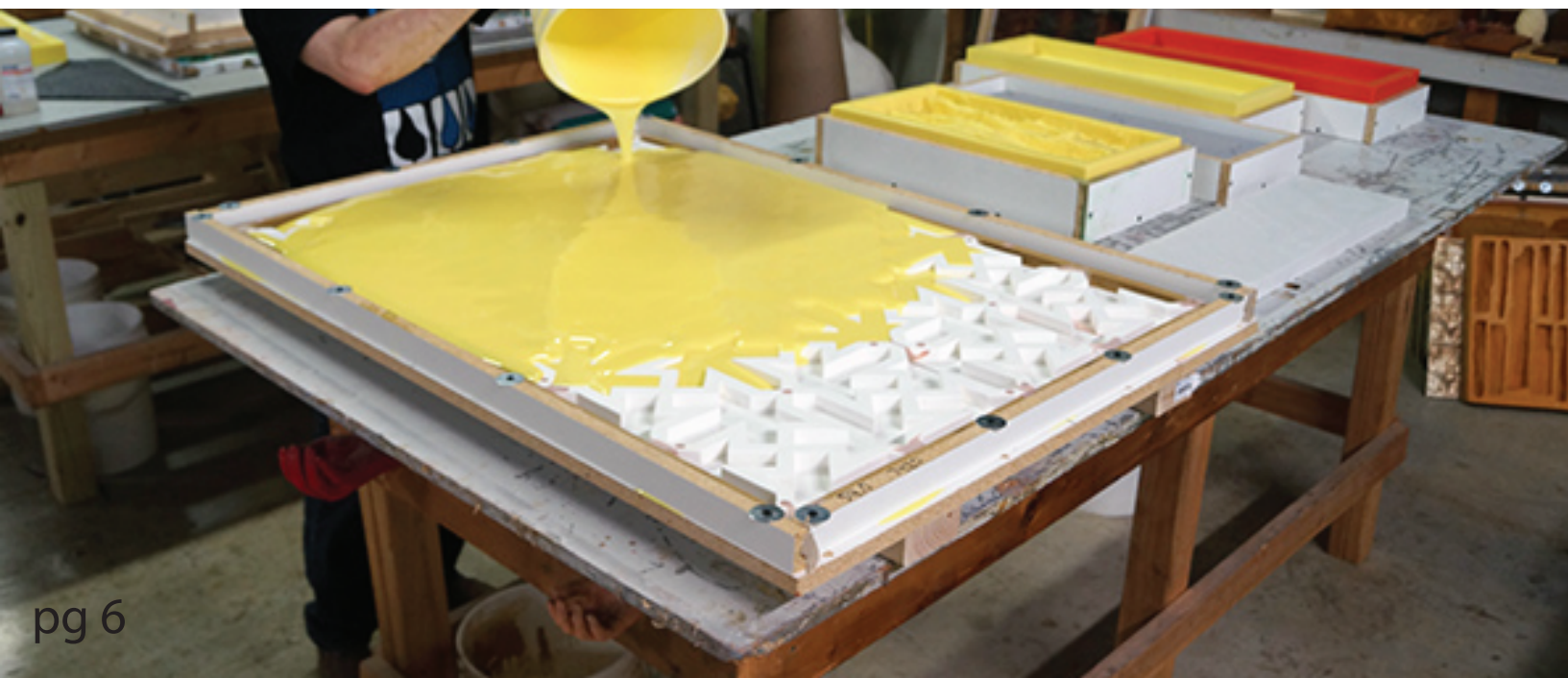
Located in Kampala, Uganda

Contact Us
Plot 75B Mulwana Rd Industrial Area
P.O Box 5961 Kampala Uganda
Tel: +256 414 259358
Fax: +257 414 342455
Email: nicehouse@onfocom.co.ug
Web: www.nice.co.ug

PRODUCTION

In order to establish an effective and fast production rate for plastic, a mold must first be created. This initial cost will be expensive, but the mold can be reused to produce plastic items an innumerable amount of times. A way to reduce the cost of the mold is to make it from recycled aluminum.

The scavangers that are being hired to look for plastic also look for aluminum that other companies buy off of them. The aluminum cans that are found throughout the city can be used as a mold for the plastic, reducing costs significantly. Once the mold is created, production of the object will be quick and cheap. All materials and labor will take place in Uganda!



PRODUCTION

TO MAKE MOLD

ALUMINUM

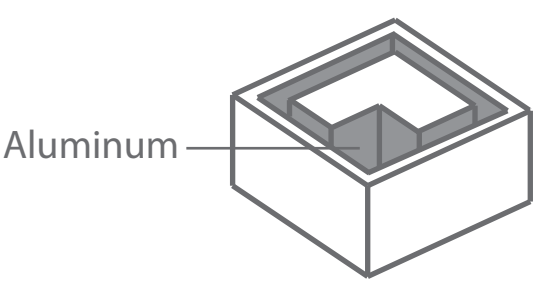
Superior malleability
Light weight
Thermal conductivity

MELTING POINT

1221 ° F

POUR

Pour melted aluminum into a mold that contains a hollowed out form of desired product.



TO MAKE PRODUCT

HDP BLOW INJECTION

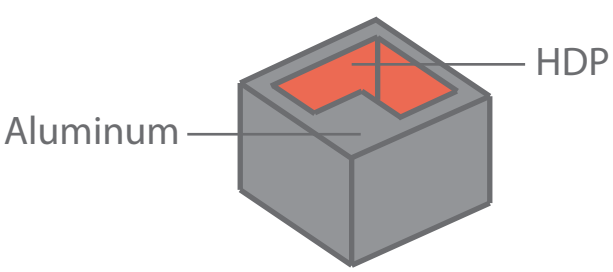
High stifness property
Moisture resistant
Strength

MELTING POINT

338 ° F

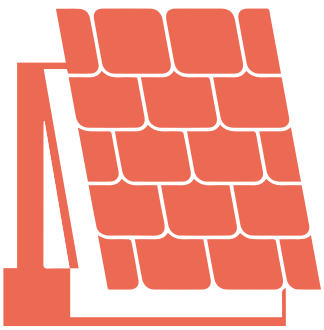
POUR

Pour melted HDP Blow Injection into aluminum mold.



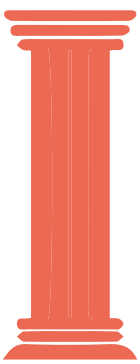
BUILDING COMPONENTS

ROOF TILES



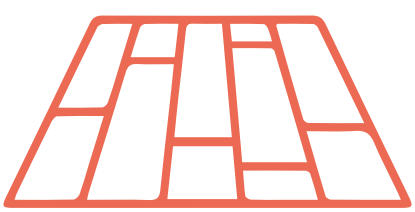
Using this process, recycled plastic roof tiles would be an extremely quick and inexpensive way to update current living conditions for South Sudanese refugees in Uganda.

STRUCTURE



Columns and beams would also be another fast and cheap building component to create with this process. It can replace wood, that is used for structure, since there is scarcity of the material in Uganda. Flexibility in length and size with this construction would allow this process to be applied to all housing.

FLOORING



HDP poses as a great solution for flooring in Uganda. Many houses are placed in inadequate locations such as swamp lands or flood zones. To reduce the significant issue of flooding in Uganda, plastic flooring can be used to seal off the ground and redirect the water elsewhere.

POSSIBILITY

Construction = Kit of Parts:

1- Recycled HDP Blow Injection Plastic is what the panels can be made out of. They are corrugated from the mold to increase strength while decreasing weight and the amount of material used. They are layed out flat before beginning the construction of folding the panels. Each house takes about an hour to two to build.

1 lb = 31¢

2- Rubber Locking Gaskets are used to hold the panels together. They remove the need for any extraneous hardware and material, making the construction very simply to complete. These rubber seals reduce the risk of air leaks, provides as insulation and behave flexible against storm winds and earthquakes. They allow the panels to be folded up to create the house without any other materials. They are applied to every single edge of a panel to fully enclose.

100 ft = about $100

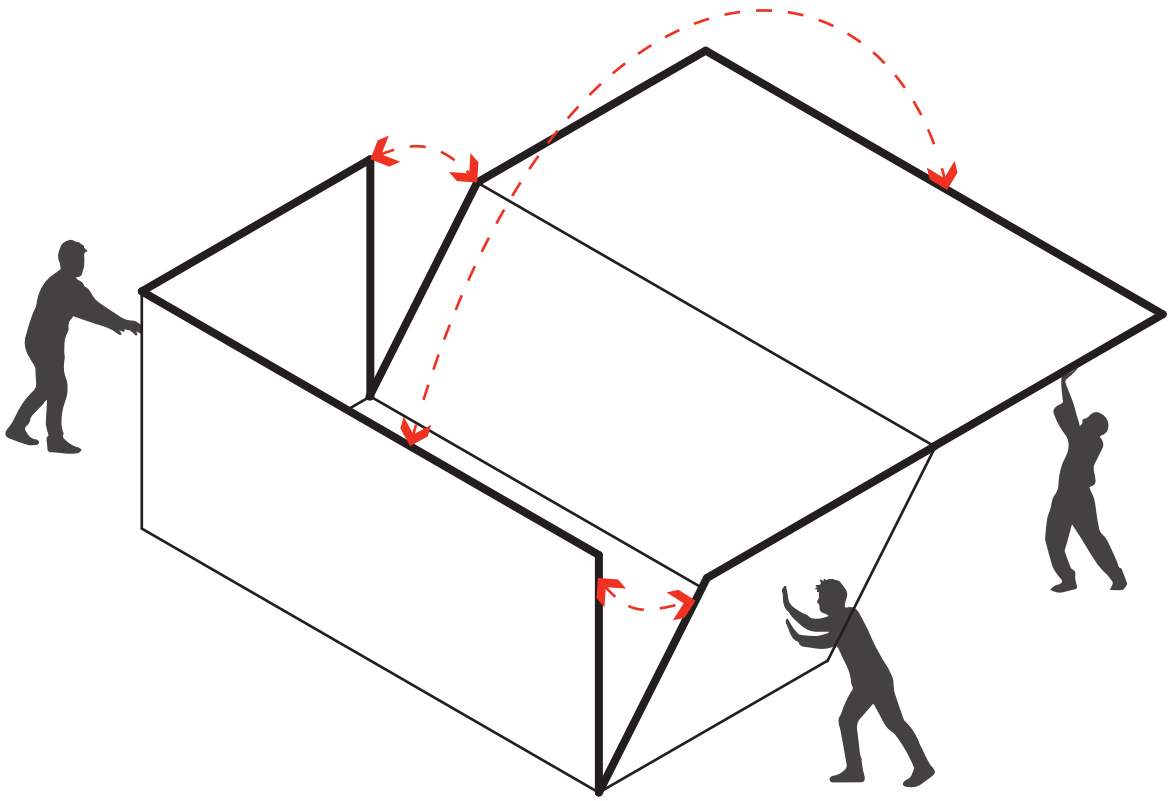
Length of Locking Gasket needed: 172'

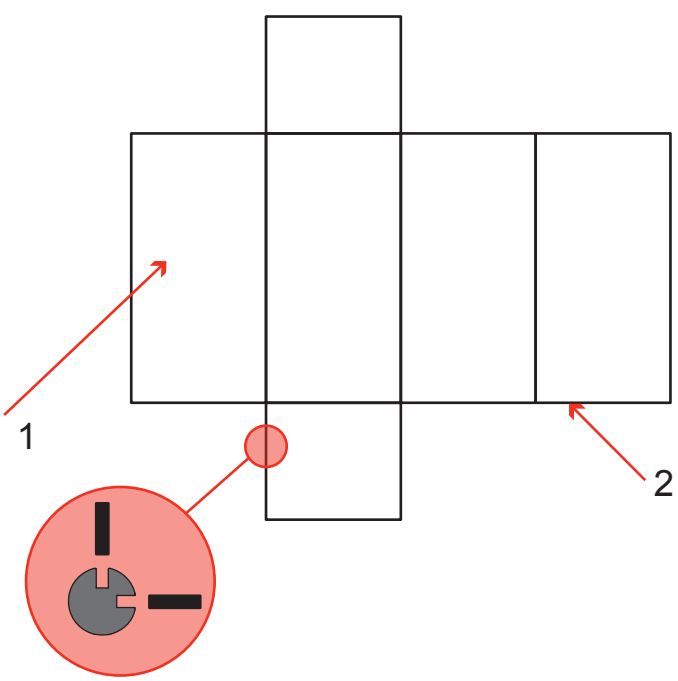
= $172

20' x 10' x 3" Recycled PVC Panel =
29.4 lbs= $9.40 x4
10' x 9' x 3" Recycled PVC Panel =
3.2 lbs= $4.25 x2

= $46.10

POSSIBILITY





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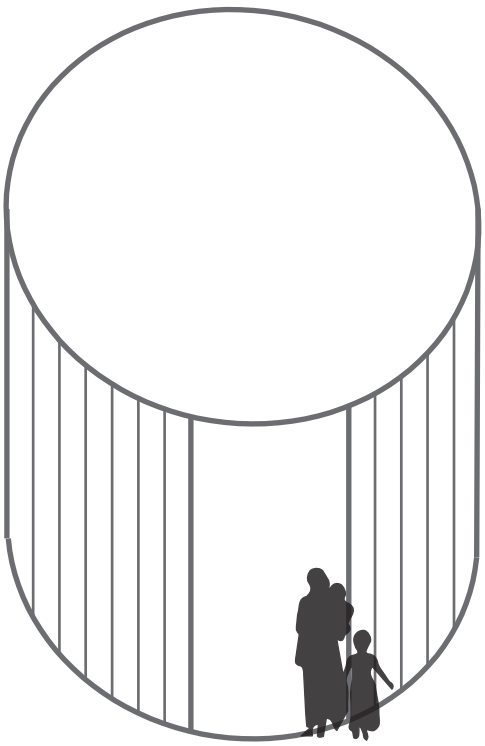

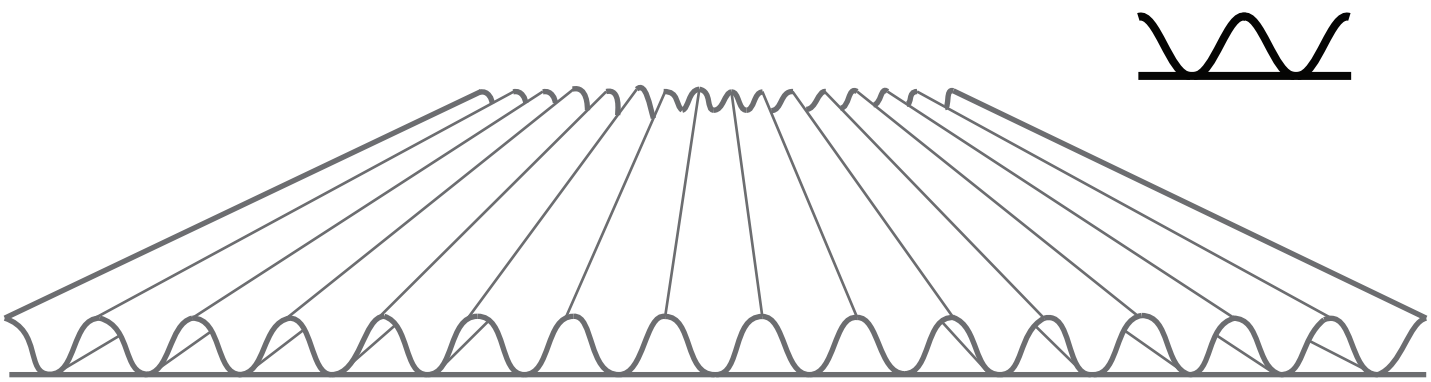

Stronger & More Durable than Corrugated Fiberboard
Available in a Vareity of Weights
Tear, Puncture and Impact Resistant
Resists Dirt, Grease and Moisture
Easily Cut with a Utility Knife
Can be Easily Rolled Up

SOURCES

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