

Types of Plastics & their Physical Properties

Plastic type	Index number*	Melting temperature/°c	Boiling point/°c	Combustion point/°c	Density/ gcm-3
PET	1	250-260	350	500-800	1.38
HDPE	2	130	360	340-380	0.94
PVC	3	75-90	decomposes	455	1.40
LDPE	4	110	300	360	0.91-0.94
PP	5	160-170	decomposes	570	0.90
PS	6	240	decomposes	488-496	0.96-1.04

Processing Methods

We also made the aluminium molds at Timber market. In so doing the team gave the specifications (dimensions) to the bread pan maker called Mohammed and he made them by applying his working knowledge. We used a 20cm*20cm which is the module of the AMP makerspace, since it is our intension to recycle some of these plastics for use in the makerspace.

Plastic Stewing

Stewing however involve bring different plastics to temperatures close enough to their melting range temperature. Therefore causing the bond to loosen up enough just to enable free form molding

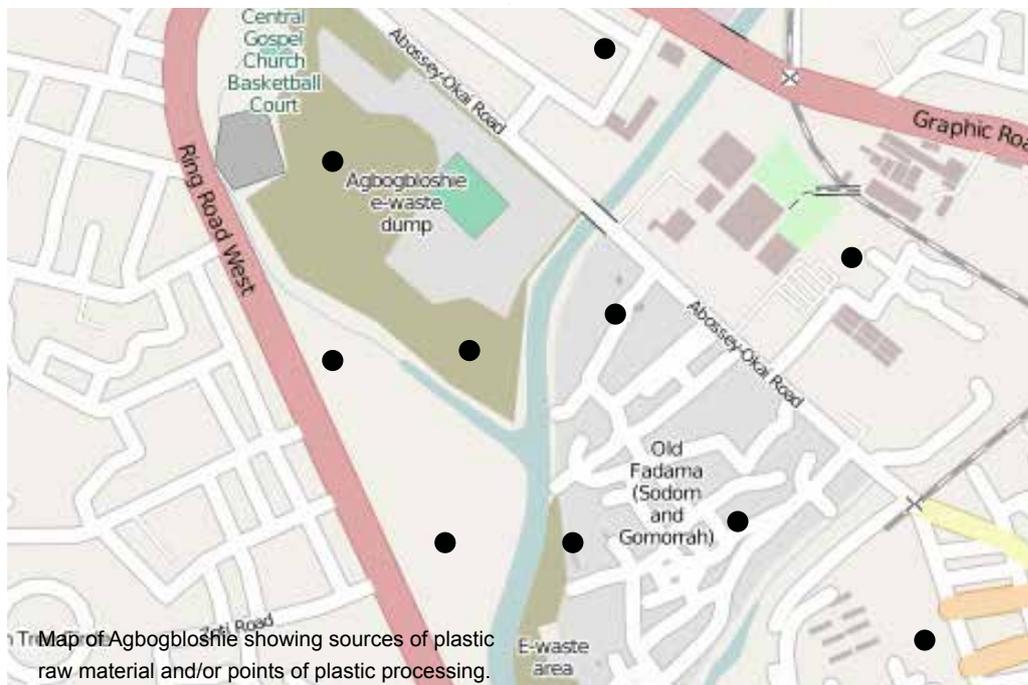
Plastic Impregnation

Plastics impregnation is a term used to describe the filling of air pores in porous materials with plastics, so as to improve their impermeability as well as strengthen them. In doing this one dissolves the plastics, PS in our case in a solvent thinner or petrol. This form a colloidal solution for the incubation or

Plastic Melting

Melting basically involves bringing the plastics to their respective melting temperature ranges; 250-260°C for PET, 160-170°C for PP, 130°C for HDPE, 110°C for LDPE and 240°C for PS.

Urban Mining (Sources)



Health and Safety

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Safety Gear



Materials for processing

Heating system: Traditional oven (dome shaped), gas oven, or gas stove
 Buckets
 Aluminium pans
 Thermometer
 Sauce Pans
 Ladles (Aluminium and wooden)
 Cooking Oil
 Plastics (PET,PP, HDPE,LDPE, PVC, PS)
 Paint Thinner, acetone or petrol

Procedure: Melting

1. First you obtain materials (plastics).
2. Cut or shred them into pieces
3. Wash and dry the plastic materials.
4. Next you heat up the oven.
5. Then pour plastic into mold.
6. Put mold containing plastic into the oven.
7. Check the temperature of oven periodically.
8. After the plastic melts, take it out to cool in a lukewarm oven gradually.

Impregnation

1. First you obtain materials (plastics).
2. Cut or shred them into pieces
3. You wash and dry the plastic materials.
4. Pour solvent (petrol, thinner or acetone) into a bowl.
5. Pour the pieces of PS into the container containing the solvent.
6. After it completely dissolves, dip paper into dissolved PS or use a paint brush to coat the surface and leave to dry.



Stewing

1. Obtain and source the plastic materials
2. Cut or shred them into pieces
3. Wash and dry the plastic materials.
4. Heat the oven and put a on it.
5. Pour oil into pot and allow to heat for a period of time (do not let it boil !!).
6. Pour plastic into the pot ontaining the oil.
7. Stir to attain equilibrium with a wooden ladle.
8. At a stage that the plastic softens, bring out the plastic and mold it into desired shapes.

Pre-cast Building Panels

One of the future applications that AMP intends to explore in collaboration with makers and recyclers inside Agbogbloshie is in the design, production and sale of precast building panels. The range of possibilities span residential applications, lowcost informal commercial(kiosk) applications and the like.

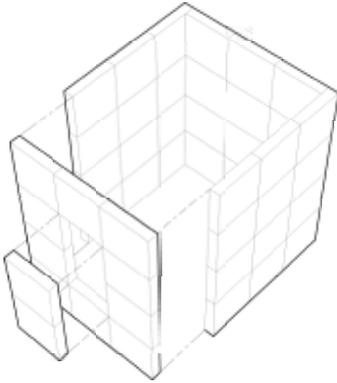


Image 1: Precast recycled plastic panels for low cost informal shelter.

Insulation

Plastics such as P.S. when recycled, can provide appreciable levels of insulation from the sometimes harsh tropical climate conditions. These can be designed to be embedded in wall systems of various kinds.

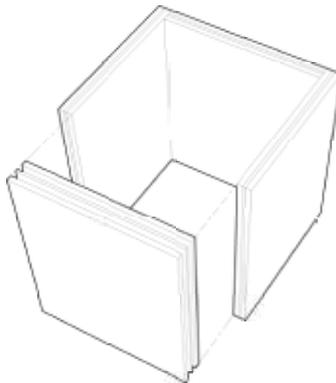


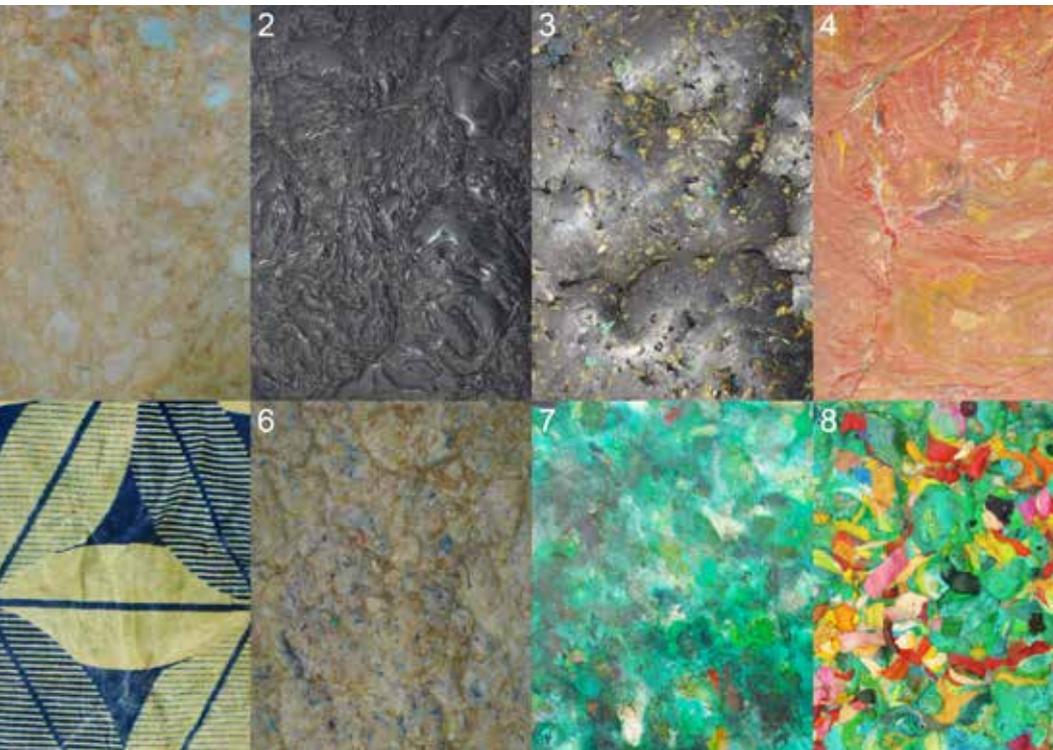
Image 2: Recycled plastic insulation panels for low cost informal shelter.

Skins: Fabric+Paper.

Various forms of water resistant skins(fabrics and paper can be produced from recycled plastics. these are looked at as skins because of their applicability from building envelopes to wearables. Water proof paper produced from recycled plastics, can also have multiple outdoor and/or open air uses.



Image 3: Wearable paper, with the possibility of being water-proofed by coating with plastic .shelter.



References/Notes

1 Hageluku, Improving metal returns and eco-efficiency in electronics recycling – A holistic approach for interface optimization between pre-processing and integrated metals smelting and refining, IEEE International Symposium on Electronics and the Environment, 2006, page 218–223 [ref] ewasteguide.info

***Calculation on estimated value:**

Prices of materials vary in Agbogbloshie depending on the local market. Also the state of the materials also influences the price, that's the price of burnt copper differs from that of the unburned by 1 Ghana cedis per pound. In Agbogbloshie, copper and aluminium are weighed in pounds (lbs) and iron/steel is weighed in kilograms (kg). The prices we used in this calculation are that charged as at July, 2014.

Calculation inputs:

- Total weight of equipment (W): kg
- Weight percent of material (W%): %
- Weight of material (Wm): W% * W
- Price per material = Wm * amount in GHC per kg
- (1 kg = 2.204 pounds)

** These types of EEE are mostly found and dismantled in Agbogbloshie.



For more information, visit:
<http://qamp.net/plastics>

Introduction to Plastics

Plastics are everyday materials used domestically and industrially. Statistically speaking, about 72% of our household appliances have some plastic components, however it is no-biodegradable. The special properties of plastics such as low density, low electrical conductivity, transparency, and toughness allow plastics to be made into a wide variety of products. The development of plastics has come from the use of natural plastic materials and since plastics are environmental-friendly they have been domestically embraced because pure plastics have low toxicity due to their insolubility in water. Some uses of plastics are: water bottles and transporters, waste bins, foot wear, bowls, tiles, amongst others.

Recycled Plastics

