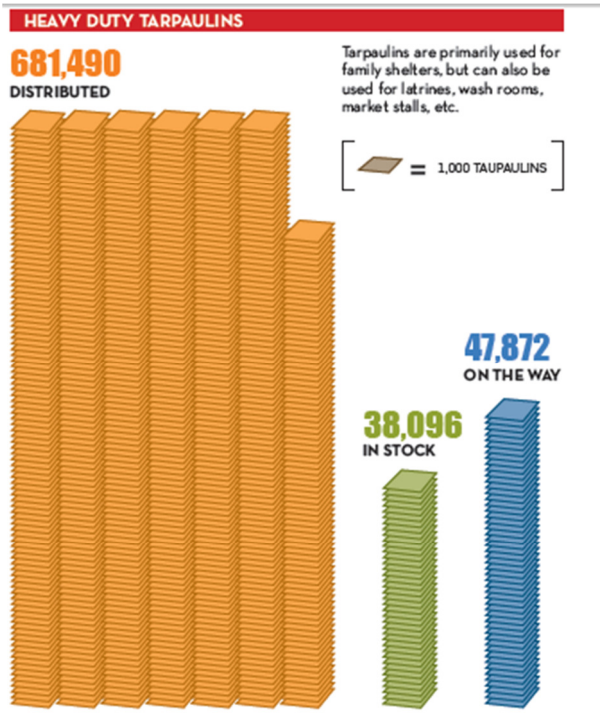
IASC Inter-Agency Standing Committee
HAITI SHELTER CLUSTER

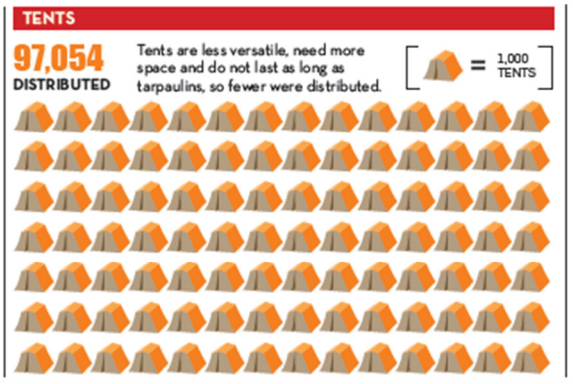
Reuse, recycle and disposal of emergency plastic sheets

How many plastic sheets and tents in Haiti?

After the earthquake, approximately 700,000 heavy duty tarpaulins (plastic sheeting) and 100,000 plastic tents were distributed by shelter agencies. At present more are being distributed to replace the damaged and degraded plastic sheeting.



(As of 07/06/2010)



The 'mountain' of plastic sheets

If you laid all tarpaulins that have been distributed by Shelter Cluster agencies end on end, they'd reach **from New York City to Panama City**, **Lisbon to Moscow**, **New Delhi to Beijing** or **Nairobi to Baghdad**.

What is plastic sheeting made of?

The majority of the plastic sheeting procured for use in humanitarian relief is made by laminating a woven mesh of HDPE (High Density Polyethylene) between two layers of LDPE (low density polyethylene). Additional chemicals (such as Calcium Carbonate) are added to both the woven core and the exterior laminations to add colouring, to make the material flexible, to add UV stability and to alter the opacity.

Woven fabric: HDPE, BLACK colour
(Black colour provides privacy and reduces heating under the sheeting due to the sun).

Lamination material: LDPE, WHITE colour on at least one side
(White colour reflects heat better in hot climates)

Reuse, Recycling and Disposal

Recycling and re-use are the preferred means of disposal of plastic sheeting. Plastic sheeting, even when old, usually has some value to people, so the key challenges are often to ensure that it does not transmit disease and to ensure that re-distribution is to those who need it most.

Reuse

Plastic sheeting carries a high value even after its use as many of them can be cut into smaller pieces and be utilized for various household needs such as covering, flooring, etc.

Cleaning

Plastic sheeting must be cleaned prior to re-use. Surface dirt should be removed and the sheet then washed in a 0.2% chlorine solution to disinfect it. Ensure that cleaning areas are established 50m from any water sources so that run off does not contaminate streams or drinking water. If an individual sheet cannot be repaired to make a sufficient useable size, then a patch-work sheet can be made for uses such as for sun shields, partitions, covers for barrels or vehicles. Sand bags could also be made from the sheet.

Cut into strips

If entire sheets cannot be used, then the sheets can be cut into strips or shredded. These can be used for making rope, weaving baskets, bags, screens or fencing, and are easier to handle than entire sheets.

Shredding

Shredding reduces the area of the sheets, which makes them easier to handle and transport. The same can be done with spare plastic bags, bottles, or containers. The shredded sheets can be used in cushions and mattresses, or it can be burnt as a fuel (see incineration below). Work is under way to see how effective plastic shreds can be in the reinforcement of mud blocks or concrete.

Income generation

Work is required to clean, shred and re-use plastic sheeting. This can be tied into income generation projects.

What you need to do to reuse plastic sheeting?

1. Allow owners to remove and collect plastic sheeting before construction. If not,
2. Remove plastic sheeting from emergency shelter sites
3. Wipe them and remove any dirt from the sheets
4. Fold the plastic sheets neatly and allow owners to collect them if they would reuse sheets. If not,
5. Pile them together and allow other community members to collect them for reuse
6. If uncollected for reuse divert the material for recycling to Haiti Recycling

Recycling

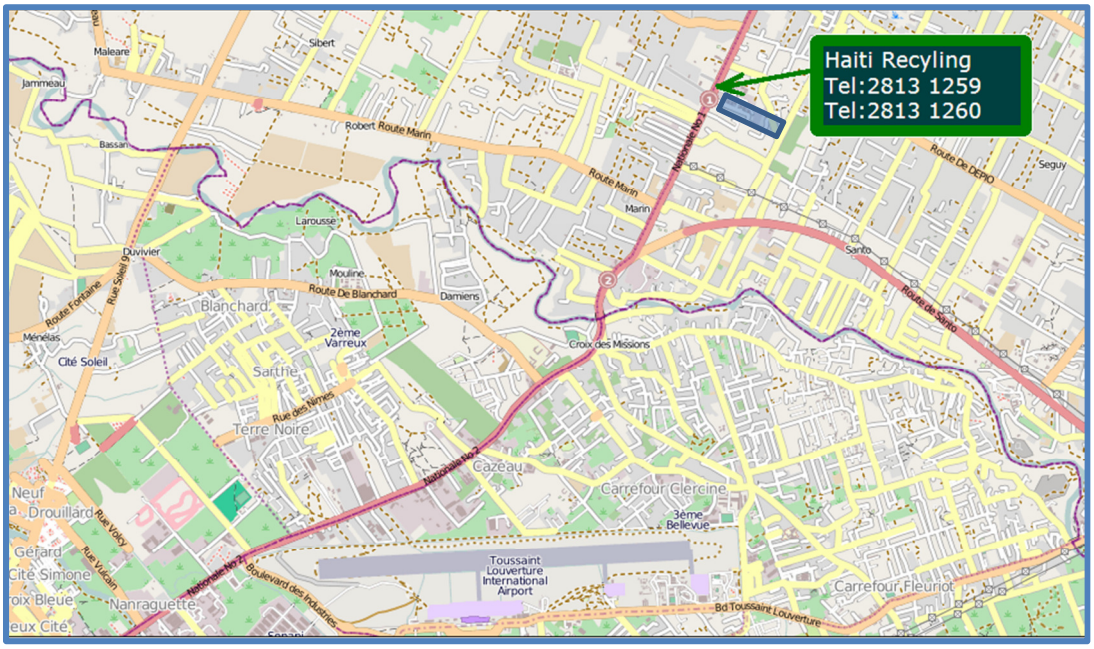
Chemically processing plastic sheet to recover materials is not usually practicable and depends on the capacity of the local recycling industry. In Haiti, the plastic recycling industry is willing and fully supportive of recycling the plastic sheeting material.

Key polythene recycler in Haiti:

Haiti Recycling

Mr. Stephan Sajous - CEO
Bon Repos, Lathan (Usine G.S. Industries en Plaine)
Port-au-Prince, Haiti
T: 509-2813-1259 / 509-2813-1260
C: 509-3701-2833

Map to Haiti Recycling:



Directions: **HAITI RECYCLING** is on the **right side** of the **Rue National 1**, **1 km** from the Texaco Fuel station junction, when driving towards the North

What you need to do to recycle plastic sheeting?

1. Remove plastic sheeting from emergency shelter sites
2. Wipe them and remove any dirt from the sheets
3. Fold the plastic sheets neatly and pile them to make a bail
4. Transport the plastic sheeting to Haiti Recycling in Lathan off Rue National 1

Why recycle?

1. You will be disposing the plastic sheeting responsibly and ensure humanitarian agencies act responsibly to the Haitian community throughout the operational phase by taking responsibility for items distributed
2. If not plastic sheeting would be burnt or thrown to the waste stream ending up as landfill waste
3. 700,000 plastic sheets would be a lot of waste in Haitian landfills that could easily be recycled in a responsible manner

Repair

Plastic sheeting is rarely welded in the field as specialised machines that operate at over 250_0C are required. Minor repairs to rips and holes in plastic sheeting can be made by stitching or use of adhesive fibre tape.

Repair - stitching
Stitching plastic sheeting is the lowest cost local solution, but will lead to the plastic leaking. It must also be done with durable thread and with tightly spaced stitches to spread the load.

Repair - taping
While minor repairs using common adhesive fibre tape ("duct" or "gaffer" tape), this material is not UV resistant and will degrade rapidly upon exposure to sunlight and rain. Using specialized UV resistant tapes (butyl) is a better option for repairs.

Disposal

Incineration (at 1200^0C)
For incineration or for using plastic sheeting as fuel, the combustion must be above 1200^0C. This is hotter than open fires or domestic stoves usually get, so industrial incinerators or cement kilns would be required. Care should be taken to check for potentially toxic "Products of Incomplete Combustion" (PICs). ***Note that the technical complexity of incineration may mean that it is not possible.***

Burial
Burying plastic sheeting is not recommended as it may remain un-degraded in the soil for hundreds of years. (It requires sunlight to help it degrade). However, plastic sheeting is relatively inert and so is unlikely to cause contamination of the soil. If plastic sheeting must be buried, it should be buried far away from any water sources.

Reference:

1. A guide to the specification and use of plastic sheeting in humanitarian relief