

## Recycling, Reuse and Disposal of Plastic Sheeting

### Operational Guidance Note

This note provides a summary guidance on the recycling, reuse or disposal of plastic sheeting used for construction of shelters, latrines and other structures. The guidance is adapted from **Reuse, recycle and disposal of emergency plastic sheets** prepared for the Haiti Shelter Cluster. Where appropriate, relevant text from the Haiti document has been used in this **Guidance Note** and is indicated by *italicized* text.

#### **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 redistribution 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).*

#### **Income generation**

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Payments can be provided to collect, clear and package plastic sheeting. Other income generating projects can include making small to large bags, barrel and other covers, sand bags, fences, partitions, screens and other products for use locally or for export.

To use plastic sheeting for income generating projects:

- Test possible uses and designs, e.g., for making bags or covers using the types of sheets available.
- Develop an estimate of the number of sheets which can be used and a work plan for the project.
- Secure agreement from owners to collect and reuse sheeting. (Since they have been given the sheets, owners may want to be compensated once the sheets have been taken for the project.)
- Remove the plastic sheeting from frames or structures, doing as little damage as possible.
- Wipe and clean (see above) the plastic sheeting and cut into sizes needed for the project.
- Dispose of any unusable plastic sheeting as per this **Guidance Note**.

In designing an income generating project using plastic sheeting it is important to ensure that:

1. The project makes economic sense.
2. There is sufficient sheeting available to make the project viable,
3. There are sufficient individuals willing and able to participate at a level to make the project viable and,
4. There is a market for products.

### **Recycling**

*Chemically processing plastic sheet to recover materials is not usually practicable and depends on the capacity of the local recycling industry.*

### **Repair**

*Plastic sheeting is rarely welded in the field as specialised machines that operate at over 2,500c 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 or above 1,200C)**

*For incineration or for using plastic sheeting as fuel, the combustion must be above 1,200c. 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).*

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The technical complexity of incineration means that incineration is not possible using less than industrial standard incinerators and not likely in a camp setting due to space, safety, air pollution and other concerns.

Cement producers may be interested in incinerating plastic sheeting as a source of energy in producing cement (klinker). The cement production process requires temperatures starting at 1,200c generally considered sufficient to fully break down the components of plastic sheeting. However, cement producers would want a sufficient quantity of plastic sheeting to mix with other fuels to make the effort viable, and would likely want to test the plastic sheeting in the combustion process before any large scale operation.

The incineration of plastic sheeting should conform to all national laws and regulations and be approved by government authorities where required. A public awareness campaign is also recommended to ensure that the reasons and safety of the incineration process are understood by those living near the incinerator site.

### **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:**

[A Guide to the Specification and Use of Plastic Sheeting in Humanitarian Relief.](#)

### **Additional Information:**

- **Environment and Disaster Management Green Recovery Connect:**  
<http://envirodm.org/helpdesk>.
- **Environment Community of Practice (Global Shelter Cluster):**  
[havedisastercallkelly@gmail.com](mailto:havedisastercallkelly@gmail.com).