Plastic Sheeting
150gsm vs. 170gsm

By Megan Dilloway and Gordon Browne
A manufacture is offering a lighter weight reinforced woven plastic sheet.

Field and Laboratory tests have been initiated.

Field tests are located in:
- South Sudan
- Zimbabwe
- Bristol
- Oxford

Laboratory tests were conducted at Southampton Solent University.
To be able to produce a comparative table that may aid Oxfam in a decision on the use of the 150gsm plastic sheeting as a replacement of the currently used 170gsm.
Objectives

1. To conduct prolonged exposure field tests that replicate the locations in which it will be used.
2. To conduct laboratory tests to determine the tensile strength of the samples.
3. To conduct laboratory tests to determine the tensile strength of the samples with exposure to high temperatures.
4. To construct laboratory tests to determine the strength of fixings currently in use and possible new fixing methods.
31st December 2012 – Field Test Started.

**Bristol**

- 150gsm
- 170gsm

**Oxford**

- 150gsm
- 170gsm
31st January 2013 – Inspection 1 (30 days).

Exposure Testing – First Inspection

Bristol

150gsm

170gsm

Oxford

150gsm

170gsm
Where possible the samples were tested in accordance with:

BS EN ISO 13934-1:1999
The results from a pilot test established the rate at which the samples would be tested:

- 20mm/min
- 200mm/min

The results lead to the decision that both rates would be used where appropriate to allow for a wider range of results.
The results obtained indicated that for both rates of testing the 150gsm performed better than the 170gsm.
Current emergencies: Syria and South-Sudan

Maximum temperatures:

Syria 46°C

South-Sudan 42°C

Plastic Sheeting was heated to a temperature between 45-50°C and then tested.
Exposure to Heat
- Results

Exposure to Heat Testing

- Maximum Load (N)

Sample 150 Non-Exposed
Sample 170 Non-Exposed
Sample 150 Exposed
Sample 170 Exposed
Result Conclusion:
The plastics tensile strength is **significantly lower** when subject to high temperatures.
Previous research into the different types of fixing was conducted by Solent University with Oxfam in 2007. The results obtained can be found at: http://www.plastic-sheeting.org/

These tests were repeated with the two samples of plastic.
Aim: To establish which rate should be used during the testing.

Reason: Time constraints.

Fixing method: Plastic Eyelets

Conclusion: 20mm/min

Note: In both tests the plastic eyelet failed before the plastic sheeting.
Please note: The sample size for the stone method was double the width (100mm) compared with the other samples (50mm)
The 150gsm plastic sheeting has performed better than the 170gsm in all the preliminary tests.

Further research:

• Effects of heat on the plastic sheeting.

The End

Thank You for Listening