

Emergency Shelter Specifications & Guidelines Tarpaulin/Plastic Sheeting, Tents & Rope

Tarpaulin / Plastic sheeting¹

Note: Plastic sheeting should be distributed as:

- 1 sheet per household (HH) of up to 5 people.
- 2 sheets for households (HH) of 6 people and more.

Plastic sheeting tends to be more preferable over tents as it:

- Permits flexible use of materials,
- Is more waterproof,
- Allows people to create improved living areas. Its relative weight allows rapid distributed at volume.

Plastic sheeting should be distributed with suitable fixings such as rope or wire.

Background

Plastic sheeting is also known as plastic tarpaulin, tarp or polythene sheet. It is a sheet of strong, flexible, waterproof material.

Although different qualities of plastic sheeting exist, those suitable for humanitarian relief are made from polyethylene to standards that were effectively agreed between major organisations in the 1990's. Some of the specifications such as UV resistance can only be found by detailed laboratory testing. As such, it may not be possible to verify all of the specifications when sheeting is procured locally.

A standard sheet has a black woven core and is laminated on both sides. All plastic sheeting must reach minimum performance standards outlined below.

Sheet Sizes & Number per Family

<i>Source</i>	<i>Size</i>	<i>Number required per family of upto 5</i>
	4m x 5m	1
	4m x 6m	1
DfID	4m x 7m	1
USAID	4m x 60	Roll cut into 10 pieces (6m lengths). One per family.

Standard specification:

Weight: 200g/m² ± 5% (ISO 3801). Add 10% for reinforcement. Lighter versions (180g/m² ± 5%) that meet the material performance specifications below might also be considered.

Core material: woven fabric high-density polyethylene (HDPE). Black colour, as this provides privacy, reduces heating under the sheeting due to the sun and is the cheapest way to reduce UV degradation.

Lamination material: Low-density polyethylene (LDPE).

Reinforcement: eyelets (sheets only) or reinforcement bands (rolls and sheets).

¹ See also www.plastic-sheeting.org, text edited from "selecting NFIs for shelter", IASC shelter cluster [http://www.sheltercentre.org/sites/default/files/Selecting NFIs for Shelter.pdf](http://www.sheltercentre.org/sites/default/files/Selecting%20NFIs%20for%20Shelter.pdf)

- Option 1: eyelets (on edges), one strong aluminium eyelet every 1.00 m \pm 5% on edges. Sealed on all sides (or 2 sides heat sealed and two sides double stitched), with nylon or HDPE ropes in hem.
- Option 2: reinforcement bands, bands of 7.5 cm width made from black woven HDPE laminated on both sides.

Tents

Note: Tents can be a priority over plastic sheeting, but **only if** of sufficient quality.

Tent Quality

Past experience has shown that when large quantities of tents are purchased at short notice, the quality remains unpredictable.

Many tents that are offered by suppliers will not remain waterproof for the heavy rains. Many others are simply too small.

Tents specialised for humanitarian relief have been developed over many years by major organisations. To purchase suitable tents requires establishing clear specifications and understandings with manufacturers.

As an example, in a survey of the estimated 400,000 tents distributed after the Pakistan earthquake in 2005, over 80% were found to be unsuitable for the weather. Most of the distributed tents required remedial distributions of plastic sheeting. This caused significant delays.

Tent Specification

The procurement of tents requires solid knowledge of tent specification. A normal tent specification runs to several pages. Failure to have a detailed specification for large scale tent procurements will frequently lead to issues with quality.

Tents should provide a **minimum of 16m²** usable covered area.

Double fly is recommended as it provides:

- A ventilated air gap for enhanced thermal performance
- Improved water resistance

Fabric should meet the specifications outlined in the IFRC Emergency items catalogue.²

More on specification is available from ""A guide to the use and logistics of family tents in humanitarian relief³.

Key Components of a Tent

A tent **must** be made of **waterproof canvas**, and must have a **strong supporting frame**. It must provide a **minimum of 16m²** covered area. Additionally, a winterised tent has the following components:

Fly Sheet

- Separate fly sheet, usually made from canvas, which fits over the inner tent.

Structural Supports

- The poles, which form the vertical supports and the ridge beam, should be made of thick gauge steel (min 1.5mm) and with an external diameter of 35-50mm. This gives suitable structural resistance to both high winds and snow loading.

Mud flaps / Valences

² <http://procurement.ifrc.org/catalogue>

³ http://www.sheltercentre.org/sites/default/files/UNOCHA_tents.pdf

- The tent must have rot proof mud flaps of suitable quality and length to allow the tent to be dug into the ground.

Rope Specification⁴

Rope is one of the most common fixings for plastic sheeting. For fixing plastic sheeting, black 8mm to 14mm diameter rope is preferred. Black rope is preferred as it resists UV degradation, although other colours (such as blue polypropylene rope) may be cheaper or more readily available.

Ropes can be made from various types of material, properties of some of the most common materials are summarised below.

Properties of the most common types of rope (Based on the MSF catalogue)			
Natural fibre	Polypropylene	Nylon / polyester	
Strength	-	+	++
UV resistance	+++	-	+
Elasticity	+	++	++++
Wear resistance	+	+	++
Resistance to rot	-	++++	++++
Cost	Cheap	Average	Expensive


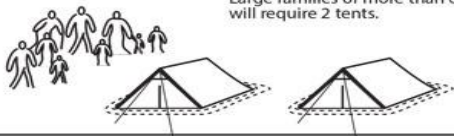
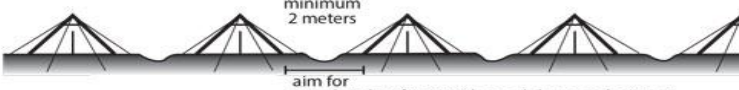




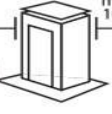

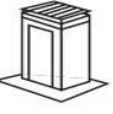

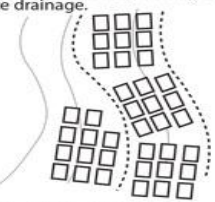
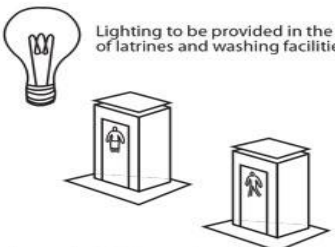
Specification - Rope:(natural fibre, nylon and polypropylene)	
Basic specification	
Weight	Large quantities are normally purchased by weight. Minimum lengths should be specified.
Dimensions	8-14mm diameter. (or 3-4mm if polyester hard braid)
Colour	Black for nylon and polypropylene, natural for natural fibres (subject to availability / cost)
Material	Polypropylene, Nylon, other polymers, or natural materials. Fibres should not be recycled (for quality).
Material specification	
Number of strands	3 or 4 strands for twisted rope. Twisted for polypropylene and natural fibres, braided for nylon.
Testing	ISO 9554
Printing and packing	
Printing	Bales of rope should be marked with type, material, manufacturer, length, tensile strength, inspection reference.

⁴ See also www.plasticsheeting.org.

Annex 1: Tent Site Guidelines

with CCCM, WASH and Protection Clusters

Transitory Tent Sites Guidelines illustrated - 20 November 2013 - UPDATED

AREA	<p>Aim for 30 m² per person for total site space.</p>  <p>Aim for 3.5 m² per person for covered living space.</p>	<p>Large families of more than 6 will require 2 tents.</p> 	
FIRE SAFETY	<p>minimum 2 meters</p>  <p>aim for 1.5 x height of tent with good drainage between</p> <p>Set up community fire committees for training and fire fighting.</p>  	<p>50 meters FIREBREAK after 300 meters</p> <p>Make fire stations with buckets, sand, fire beaters and fire extinguishers.</p> 	
SANITATION	<p>Support people to dig drainage ditches around tents to prevent the tents from flooding with rain.</p>  <p>Connect drainage ditches from each tent to a site drainage solution.</p>	<p>15 - 50 meters away from tents</p> <p>Latrines</p>  <p>minimum 1 for every 40 people</p> <p>Hand Washing</p>  <p>minimum 1 for every 10 toilets</p> <p>Shower</p>  <p>minimum 1 for every 80 people</p>	
SITE SAFETY	<p>Clear and inclusive information dissemination. Consultation and Participation in decision making. Referral and grievance mechanism.</p> 	<p>Site drainage should be well planned and maintained. Consider topography in site planning to allow surface drainage.</p>  <p>Where possible, pitch tents in clusters to provide community-like settings.</p>	<p>Lighting to be provided in the area of latrines and washing facilities.</p>  <p>Segregated latrines and washing facilities with clear physical separation.</p>

Reference:
Sendong Shelter Cluster, Technical Guidelines, Jan 2012
Sendong WASH cluster, Operational Principles and Practices - 14 Jan 2012
OCHA, Tents: A guide to the use and logistics of family tents in humanitarian relief, 2004

NRC, The Camp Management Toolkit, 2008
UNHCR, Handbook for Emergencies, 3rd Edition
www.josephashmore.org