

Comparison of plastic sheeting specifications of major organisations: 20 Dec 2006,

Organisation	IFRC/ICRC/MSF/ OXFAM	UNHCR	IOM	UNICEF	UNICEF	USAID	zero fly ®	
basic specification	sheet size	4m x 6m	4m x 5m	4m x 5m	4m x 5m		4mx5m	
	roll size	4m x 60m (rolls)	4m x 50m			4m x 50m	30.48m x 7.315m +1% -0%	
	specific cmments					groundsheets	treated wuth deltamethrin, 360mg/m2	
	weight g/m2	200g/m2 ± 5%	200g/m2 ± 5%	180g/m2 ± 3%	190 g/m² Min (9)	275g/m2	240g/m2	180g/m2 ± 3%
	woven fabric material	HDPE	HDPE	HDPE	HDPE	polyester mesh (12mmx12mm)	HDPE	HDPE
	woven fabric colour	black	black	black	undefined	undefined	black	white
	lamination material	LDPE	LDPE	LDPE	LDPE	polyethylene	X	LDPE
	lamination colour	white	white	white	white (top) + cyan (bottom)	white (top) green (bottom)	beige(top), white (bottom)	blue
	re-inforcement bands or eyelets	grey bands (1)	aluminium eyelets	aluminium eyelets	aluminium / copper eyelets	plastic 70mm eyelets	no eyelets or bands	aluminium/steel or brass
	eyelet spacing	NA	at 100cm ± 5cm on sheet sides	at 100cm ± 5cm on sheet sides	at 100cm ± 5cm	at 950mm centres + double row every 5m	supplied with 5cm wide adhesive tape	at 1m
sheet edges	reinforcement bands	sealed + nylon ropes (5)	sealed + PP rope in hem	sealed + nylon ropes (5)			sealed with nylon cord (5Kn)	
technical specification	tensile strength (warp + weft)	min 500N (ISO 1421)	min 600N (BS 2576)	X	min 600N (BS 2576)	min 600N (BS 2576)	732N (ASTM D 751)	min 500N, (ISO 1421)
	tear strength	min 100N (ISO 1421)	min 100N (BS 4303) (7)	X	min 100N (BS 4303)	min 130N (DIN 53363)	222N (ASTM D 751)	X
	bursting strength	X	X	X	200N/cm2 (BS 4768)	200N/cm2 (BS 4768)	2070KPa (ASTM D 751)	X
	welding	max. one welding	X	X	X	X	made from two panels (8)	X
	UV resisitance	(2)	(2)	"UV stabilised"	"stabilised against UV rays"	"High UV/IR resistance"	>80% strength after 2000 hours (ASTM G53)	(3)
	temp resistance	temp resistant from -20 to -80	X	X	X	X	X	X
	flammability volatiles	flash point above 200C	flash point above 200C (4)	X	flash point above 200C	flash point above 200C	X	X
finishing	printing	logo on request	UNHCR logo on both sides	IOM Logo on both sides	UNICEF Logo on both sides	UNICEF Logo on top side	AID logo on both sides	X
		manufacturer details (6)						
		mark every meter.					mark every 3.048m along sheet	

(1) 6 woven laminated HDPE bands, 7.5cm width

(2) (UV standard 1) max 5% loss on original tarpaulin tensile strength under ISO 1421 after 1500 hours UV under ASTM G53/94 (UVB 313 nm peak)

(3) (UV standard 2) max 10% loss on original tarpaulin tensile strength after 1500 hours UV under ASTM G53/94

(4) Flammability (CPAI 84-1995, section 6):

(5) reinforced rims sealed on all sides (or 2 sides heat sealed and two sides double stitched), and nylon ropes in hem. 1000 denier min.;

(6) manufacturer name, month and year of production

(7) BS 4303 - wing tear or equiv.

(8) Seams shall be 1" to 1 ½" (2.54cm to 3.81cm) wide and separable by hand strength in the peel-back direction along the length of the seam.

(9) note: 190g/m2 is equivalent to 200g/m2 ± 5%

**Comments:**

- The specifications being compared have been received direct from various organisations, or in the case of zero Fly ®, taken from manufacturers web sites.
- The inclusion of zero fly ® is not intended to provide preferential treatment for individual manufacturers but to inform technical discussion of ITPS
- The most significant differences between the specifications are:
  - 1: whether or not the woven HDPE base fabric is black (all specify black apart from UNICEF and Zero Fly)
  - 2: weight of sheets: all apart from IOM and Zero fly are minimum 190g/m<sup>2</sup>
  - 3: size of sheets: ICRC/IFRC/Oxfam/MSF all specify 6mx4m, other organisations specify 4mx5m
  - 4: finishing of sheets: ICRC/IFRC/Oxfam/MSF specify reinforcement bands, other organisations specify seamed edges with various types of rope in the seams. Where roped seams are specified, so are eyelets.

In terms of test specifications, there several difference between the performance specifications, the most critical variations being with UV stability

- It is interesting to note that various standards are used by different organisations for the strength tests: ISO standards, BS standards or ASTM standards in the case of USAID. These variations make direct comparison more difficult.
- Other than USAID, standard roll / sheet widths are 4m

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