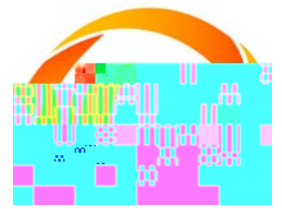




# Sun shade structures from BBC Plymouth (Andrew Brown)

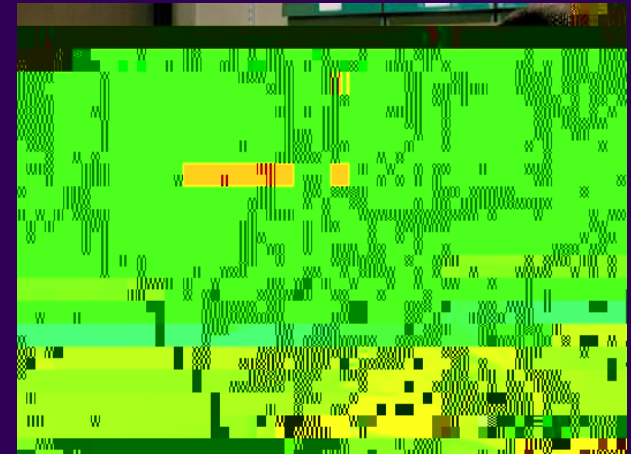
August 2006



# UPF definition



UPF (Ultraviolet Protection Factor) - how much the effect of solar UVR is reduced when passing through *fabric* of clothing



$$UPF = \frac{E(\lambda) \cdot S(\lambda)}{E(\lambda) \cdot T(\lambda)}$$

$E(\lambda)$  - spectral irradiance of terrestrial sunlight

$S(\lambda)$  - erythema action spectrum

$T(\lambda)$  - spectral transmittance

# UPF: important to know



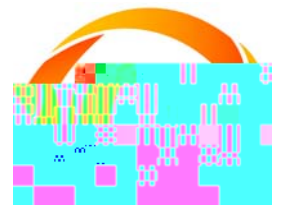
- Not simply a transmittance of fabric: takes into account that different wavelengths of UVR spectrum have different effects on human skin
- *Defined for fabrics, not garments*
- Similar to SPF for sunscreens
- Measured in 290 - 400 nm spectral range: naked eye doesn't see it
- UVA - UVR between 315 nm and 400 nm
- UVB - UVR between 280 nm and 315 nm
- UPF (and SPF) is, mainly, characteristic of UVB protection of material but UVA also has adverse health effect
- UPF15 recommended by Cancer Research UK as a minimum protection level
- Fabrics are tested according to British Standard BS EN 13758-1: 2002 "Textiles – Solar UV protective properties"

Good UVR protection: high UPF (>15) AND low UVA transmittance  
Fabric should cover skin



# UPF test results









# Results: parasols (2)



Sample No	Description	Fabric UPF	T <sub>UVA</sub> av, %
BBC_3	White Compact	16	8.5
BBC_4	Pink with black trim	15	14.5
BBC_5	Fucshia Beach/Garden Umbrella	12	23.8
BBC_10	Black Pushchair parasol	23	6.9
BBC_11	Navy Ladybird pram parasol	12	10.9

- Colours are very different - UPFs are the same
- White parasol has lower UVA transmittance than pink
- Colour of fabric is often NOT an indicator of its UVR protection

# Results: parasols (3)



Sample No	Description	Fabric UPF	T <sub>UVA</sub> av, %
BBC_3	White Compact	16	8.5
BBC_4			

# Results: parasols (4)



Sample No	Description	Fabric UPF	T <sub>UVA</sub> av, %
BBC_3	White Compact	16	8.5
BBC_4	Pink with black trim	15	14.5
BBC_5	Fucshia Beach/Garden Umbrella	12	23.8
BBC_10	Black Pushchair parasol	23	6.9
BBC_11	Navy Ladybird pram parasol	12	10.9

Same UPF, very different UVA transmittance



# Results: behed shelters

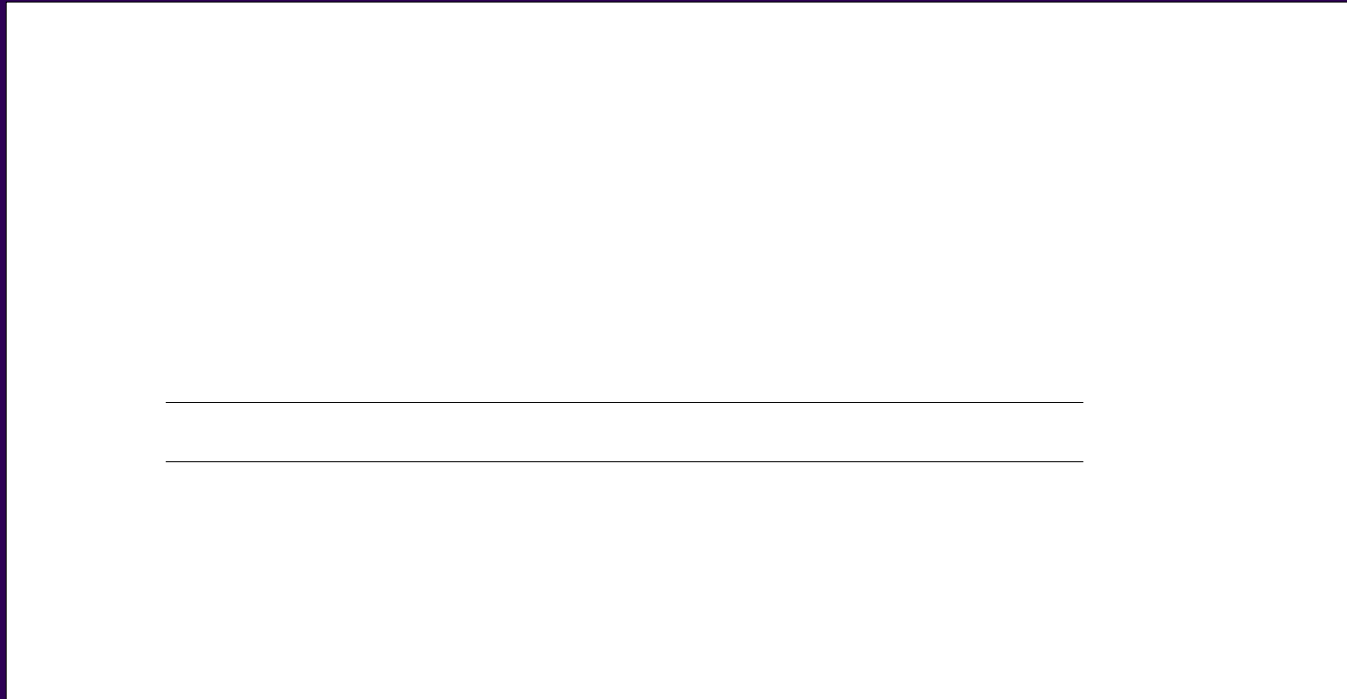
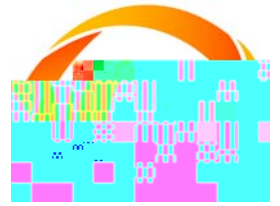


Sample No	Description	Retailer	Price	Fabric UPF	T <sub>UVA</sub> av, %
BBC_6	Monodome Beach Shelter with zip door	TrickyBDickys	£6.99	purple 12; red 12	purple 17.2; red 18.5
BBC_7	Beach Shelter with zip-up door		£6.99	Blue 17; red 15	Blue 13.0; red 14.6
BBC_8	Beach shelter	Shirley Cottage Gifts	£6.99	Blue 8; red 7	Blue 23.8; red 22.4
BBC_9	Blue and yellow behed shelter			Blue 30; yellow 14	Blue 10.0; yellow 16.1

# Results: beach shelters (2)

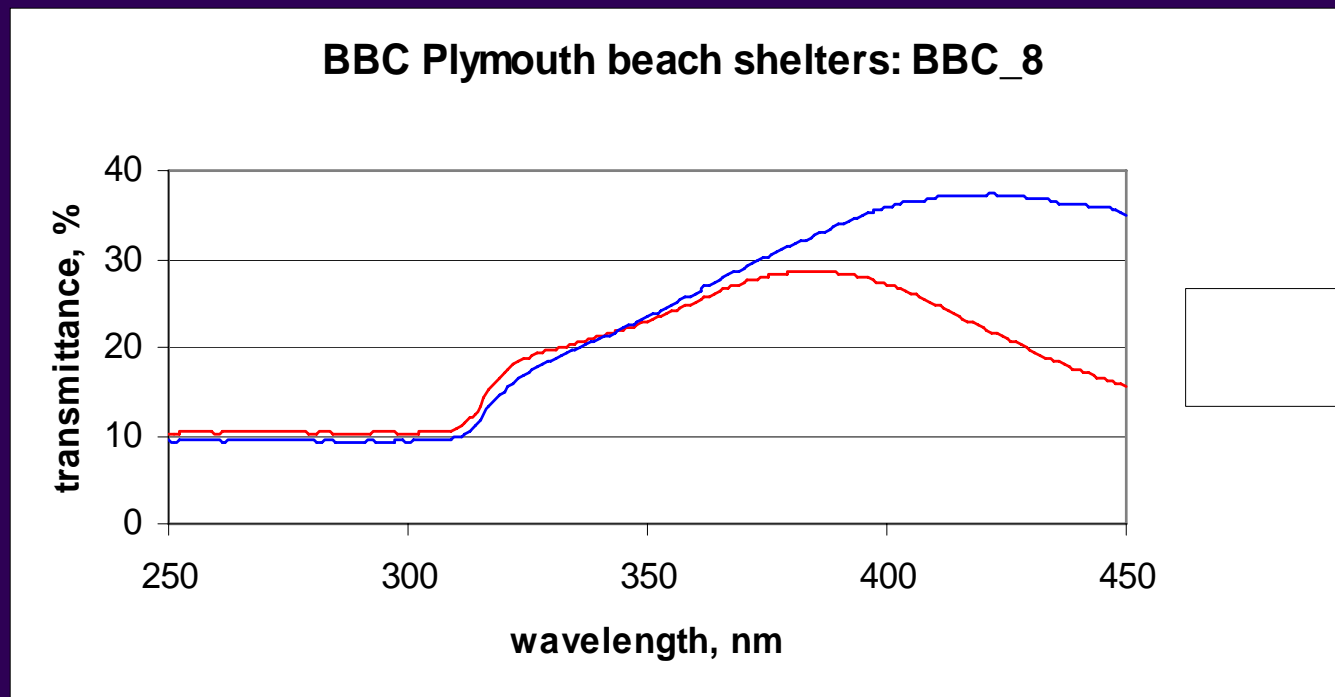


# Results: beach shelters (3)



# Results: beach shelters (4)

05





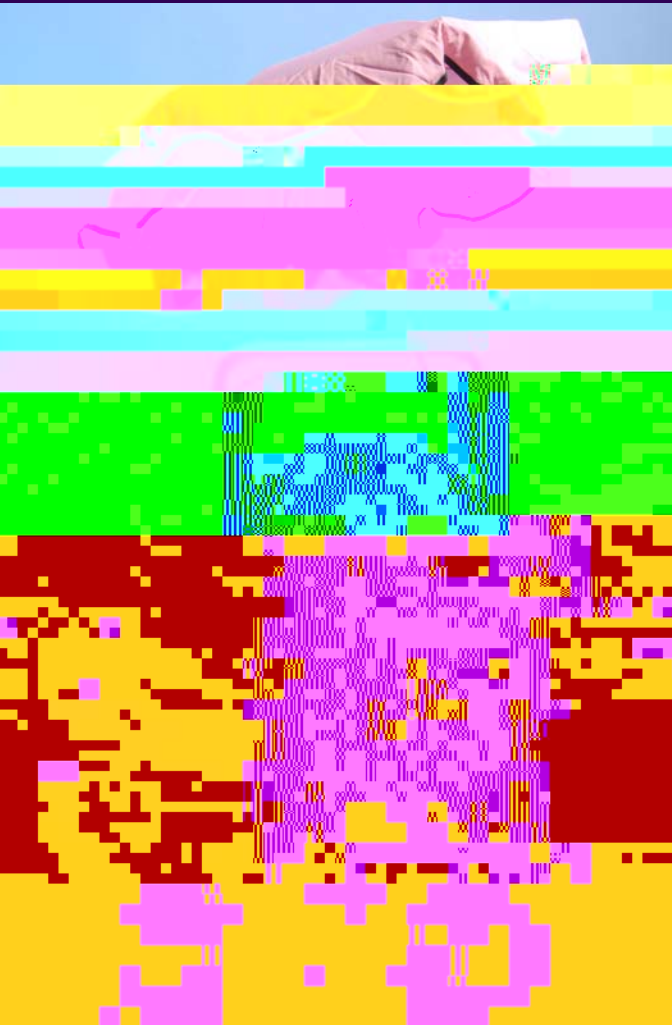
## BUT....

- UPF is a characteristic of UVR protection of the fabric, not a garment
- Good indication of the protection level but not of the real protection
- Fabric should shield the skin: if it doesn't cover skin, it doesn't protect it

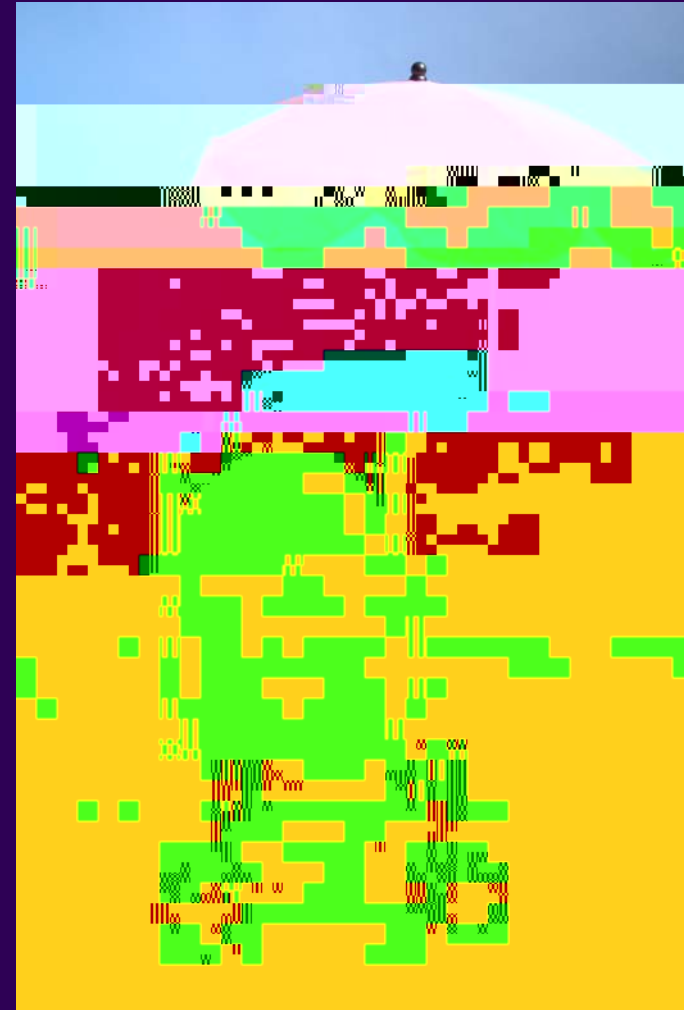




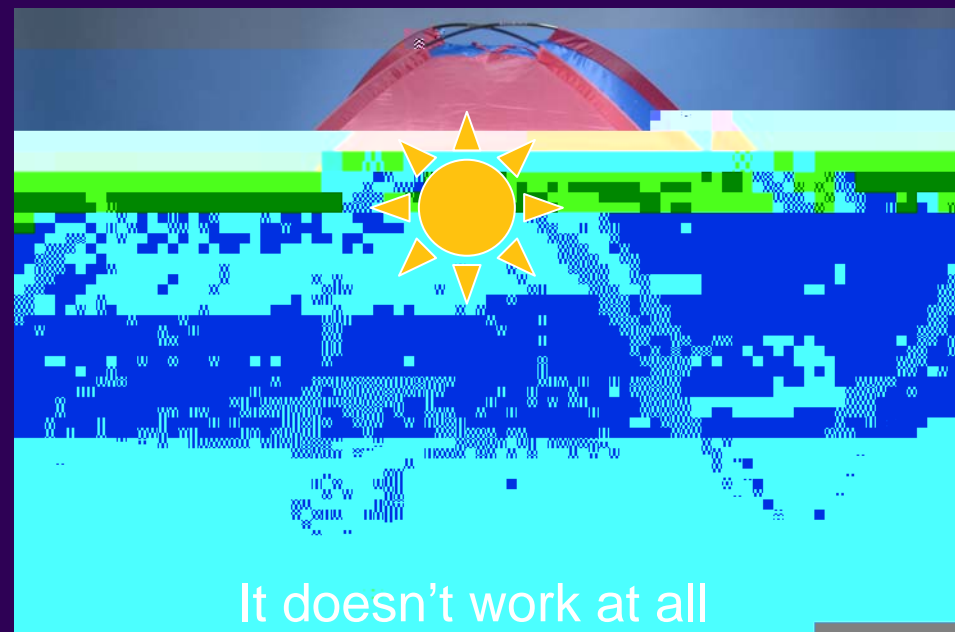
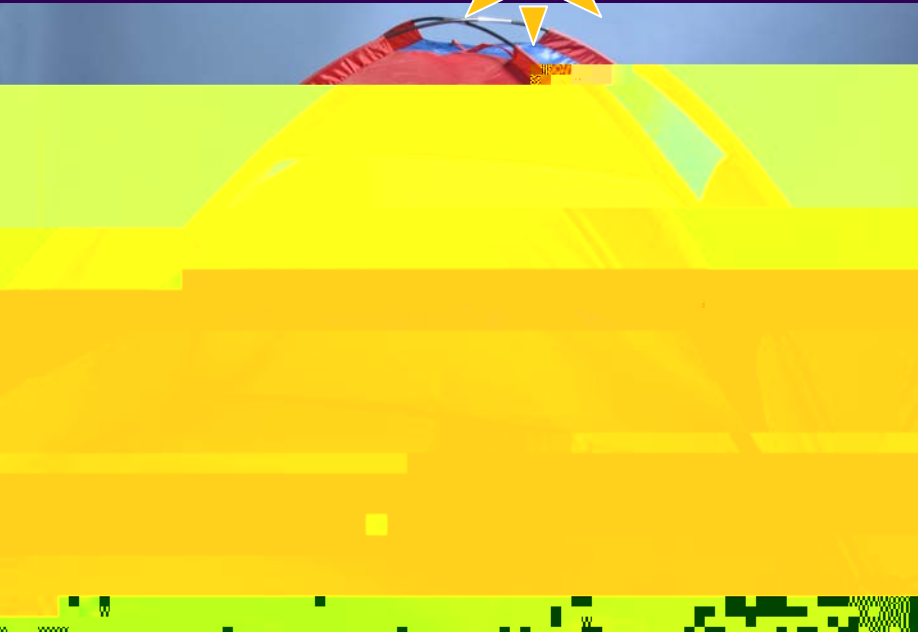
# Things to remember



The same parasol,  
the 0n09ushchairo1,



# Things to remember



The same beach shelter, the same baby: think about it when you set your shelter on a beach

If used incorrectly, might give false perception that your child is safe in the sun