Guidance on design for longevity – sportswear

Extending the lifespan and use of garments is one of the most significant ways of reducing the environmental impact of clothing.

Product overview

- Sportswear includes garments used for physical activity, from low-impact activities such as jogging, yoga, golf and walking to high-impact activities such as tennis, running, football and gym activities. It does not include swimwear.
- Sportswear is often purchased to be worn as casual attire rather than for sporting reasons.
- Items tend to be discarded due to material failure, discolouration and loss of elasticity.
- Consumer expectations concerning the fabric and fit, such as stretching, compression and other properties, will be influenced by the type of exercise to be undertaken.
- Performance criteria for sportswear include abrasion resistance, absorbency, colour fastness, comfort, dimensional stability, elasticity, elastic recovery, flexibility, piling, wicking and translucence.

Top five solutions

- Using durable material, with reinforced seams and areas where rubbing or chafing occurs.
- Providing care instructions that encourage airing clothes or washing promptly after use.
- Encouraging longer attachment to items through the use of wearable technology or personalisation.
- Adding soil-resistant or antibacterial finishes to reduce problems from body perspiration and odour.
- Selecting warp-knitted fabrics with open fabric structures (e.g. nets and mesh) to help the transport of moisture.

Extending the average life of clothes (2.2 years) by just three months of active use per item would lead to a 5-10% reduction in each of the carbon, water and waste footprints, and cut resource costs by £2bn.
What limits lifetime?

The reasons for discarding sportswear depend on the reason for purchase.

- A garment bought for fashion or casual purposes is likely to be discarded, or possibly downgraded, when it is no longer fashionable. It may also be discarded due to staining, loss of shape or wear and tear.

- These latter reasons also apply to sportswear worn for specific activities, but depending on the nature of the activity, this may occur sooner.

- Staining and wear and tear may be a result of substandard raw materials, or because fabrics have not been tested in the correct environment.

- If consumers do not follow care instructions for sportswear correctly – in particular, letting it stay damp – it can cause odour, mildew and/or mould, and degradation of the fabric.

- Garments may be discarded when the ‘smart’ element of the material, such as waterproofing, no longer functions effectively.

- Sportswear garments are not often repaired and if the material (or an accessory) fails will generally be thrown away.

Around 30% of clothing waste ends up in landfill.

The waste footprint for clothing is estimated at 1.2 million tonnes, equivalent to 5% of UK household waste.
**Recommendations on fibre and fabrics**

Fabric choice when designing sportswear needs to take special account of the movement and intended sport in mind.

- The handle, texture and comfort of the fabric used in sportswear is particularly important. It is likely to get hot or cold, be subjected to sweat, get dirty and be subject to rubbing or chaffing.

- Polyester performs well in sportswear and is used widely. It is abrasion-resistant, durable, non-absorbent, crease resistant, a reasonable insulator, moth and mildew resistant, and resistant to acids (sweat).

- Nylon (polyamide) and elastane are both strong, elastic, durable and non-absorbent. However they are non-insulating, so not recommended for outdoor sportswear designed to keep the wearer warm.

- Cotton is strong, absorbent and fairly durable, but because it does not stretch well is not recommended for all sporting activities.

- To increase resistance to both the elements and wear, sportswear fabrics may be tightly woven, while warp-knitted fabrics – such as nets or mesh – can help transport moisture.

- Soil-resistant or antibacterial finishes can be used to reduce problems from perspiration and body odour.

- It is particularly important that sportswear garments are tested for colourfastness to perspiration and dry rubbing.
Recommendations on design and manufacture

Effective sportswear design requires a balance between fashion trends – reflecting its popularity as casualwear – and performance properties.

- Classic or neutral colours (black, white, grey, charcoal, navy and brown) have greater longevity. Seasonal colours can be introduced as highlights in the form of panels, stripes, piping, contrast stitching or lining.

- Performance features such as reinforcements for areas most likely to suffer from rubbing, extra lining to reduce abrasion or high-visibility elements need to be included in ways that do not detract from the overall appearance of the garment.

- Multi-functionality can help increase wear: walking trousers can be produced with zips around the leg area that enable the bottom part to become detached, so they can be shorts in hot weather and long trousers in colder weather.

- Approaches such as stitch-free welding and complete garment technology can eliminate the risk of broken seams particularly for stretch fabrics.

- In general, the best way to join sportswear garments is using flat fell seams: waterproof seams may be required for some sports.

- Personalisation and limited edition garments can add value and encourage consumers to retain them, as can the addition of secure pockets for technology (e.g. phones, media players).

- Smart textiles and wearable electronics are of particular relevance to sports wear and there is a growing volume of research into both effectiveness and suitability.
Recomendations on care and repair

Consumers need good advice on caring for sportswear garments because they will be subject to soiling, staining and perspiration more than other types of clothing.

- Care instructions can highlight the importance of prompt laundering after physical activity, rather than leaving wet or sweaty garments in a sports bag, which may encourage the progressive breakdown of fabrics, including mildew in cotton-based garments.

- Airing of garments can be recommended where possible to reduce excessive laundering; tumble drying may be best discouraged due to its aggressive effect on textiles.

- If garments have motifs, consumers may need to be reminded to iron these on the reverse.

- Specific care instructions may be needed for performance fabrics and wearable technology. Home repair may not be possible to such garments.

- Home repair kits – including correct-coloured thread, spare buttons and other components, as well as instructions – could encourage consumers to make small repairs themselves to garments where this is possible.

- For higher-value items such as coats, there is an opportunity to develop specialist aftercare services or identify companies to recommend to customers.
Recommendations on re-use and discard

Sportswear may not be re-used as much as other clothing due to the nature of its initial use, but there are still some opportunities for re-use as well as recycling.

- For garments that are still in good condition – for example, sportswear that children have grown out of – there may be opportunities for resale and re-use, through schools, sports clubs, charity shops and other channels.

- Garments that are worn out and no longer suitable for the main sporting activity they were designed for may still be suitable as casualwear, or for activities such as gardening or walking.

- Retailers can provide advice on labels or through their websites on possible opportunities for re-use, and encourage consumers to give items to charity.

- Many consumers are relatively unaware of the possibility of recycling clothing, so may assume that items that cannot be re-used should be thrown away. Retailers can therefore help raise awareness of specialist recyclers.

- Garment design can affect the ease with which clothes are recycled. Using a single fabric facilitates recycling, but where multiple fabrics and components are used, there is scope for designers to make it easy to disassemble these, without compromising the robustness of the product.
This is one of a series of Guidance Notes for product development teams offering guidance on design for longevity.

For further information visit:

www.wrap.org.uk/clothing