

# Guidance on design for longevity – casualwear

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

## Product overview

- Casualwear includes t-shirts, leggings, sweat tops, skirts, trousers, shorts, blouses and shirts.
- It is one of the largest sectors of the market, with vast quantities bought and disposed of every year.
- Casualwear garments can be produced quickly and at low cost – and hence have become particularly associated with disposable or fast fashion: on-trend items are cheap and ubiquitous, but not manufactured to last.
- The knowledge exists to produce higher quality garments that would have a longer lifespan: the challenge is around proving the commercial case for investing more in production.
- A business model could be developed around producing garments that last longer and marketing this additional longevity as a key benefit to consumers, who would in turn be willing to pay more if longevity was assured.

## Top five solutions

- Selecting high-quality fabric and testing rigorously for performance, including colourfastness and pilling.
- Providing clear and simple care and laundry instructions.
- Designing-in adjustable features to accommodate fluctuations in body shape.
- Where appropriate, designing garments with detachable parts which can be replaced when they become soiled or worn.
- Providing styling guidance for the consumer to encourage longer use and potential re-use.

*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.*

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## What limits lifetime?

The focus on low cost and trend-driven fashion over quality and style of products has reduced the longevity of casualwear in recent years.

- Garments are rapidly discarded when no longer in fashion.
- Price pressures mean that raw materials and components are often of a low standard and so susceptible to fading, shrinkage or loss of shape.
- The need to deliver quickly means that speed is prioritised over quality in production processes – so garments can easily tear or develop holes.
- Where garments do last longer – for example, among less fashion-conscious consumers – they are rarely designed to be responsive to changes in body size or shape.

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## Recommendations on fibre and fabrics

The first, fundamental step to producing casualwear that lasts longer is to improve the quality of fabrics used.

- Fibres such as wool, nylon and polyester are recognised as being hard-wearing and so can be a good choice.
- Industry-standard tests including fabric weight per unit area, knit/weave density and tear strength rating can be used to ensure selected fabrics meet the desired requirements for durability.
- Including elastomeric yarns in fabrics with knitted structures will help with stretch and recovery properties; this is particularly useful for close-fitting garments.
- Good quality knitted rib trims at neck hems and cuffs can help avoid t-shirts and sweatshirts losing shape.
- Fabrics such as cotton or wool can be pre-shrunk prior to production.
- Colourfastness tests against perspiration, wet and dry rubbing, and washing are all recommended.
- Fabric finishes that address moisture, stains and odours for t-shirts, sweatshirts, blouses and shirts can be marketed as an additional benefit.



Image: smartwentcrazy

**Selecting mid-tones and marl textiles can increase longevity**

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## Recommendations on design and manufacture

Well-considered design and construction can prolong the life of casualwear garments.

- When designing casualwear for longevity, the latest trends are best avoided.
- Classic shapes will result in consumers wearing such garments for longer. Classic or neutral colours have greater longevity compared to fashion or seasonal colours. Marls are also long-lasting as they do not fade.
- Longevity can be increased by allowing garments to be adjusted as body size changes. Features such as an adjustable waist, pleating, adjustable button fastenings and wide seam allowance can all be of use.
- Usage and lifespan can also be increased through versatility. A strapless dress could be converted into a long-sleeve top; longer length t-shirts can be worn tucked in or loose to create different looks.
- It could be possible to produce casualwear with detachable parts such as collars or cuffs which can be replaced when soiled or worn.
- No-waste, interactive and complete garment designs offer the potential for innovative styles and bespoke fits, but also greater longevity, as stress on the fabric is distributed equally throughout the garment.
- A range of best practice exists around casualwear manufacturing to increase lifespan of garments – such as always using 4-thread overlocking for knitted and stretch fabrics to provide added security of seams, and serging fabrics prone to fraying.
- Garment specific action sheets allow designers to set standards and facilitate quality production.

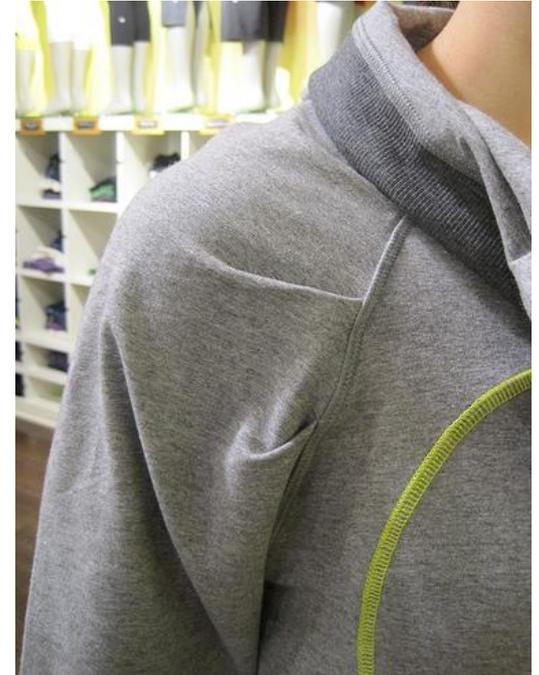


Image: Lululemon athletica

**Pleated shoulder detailing promotes movement, comfort and wear**

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## Recommendations on care and repair

Even with lower-cost garments, changes to care practices can increase the lifespan of casualwear and deliver wider environmental benefits, by reducing resource use. Retailers can help drive this with clear information on care labels, as well as through websites and point-of-purchase information.

- The risk of damage through laundry can be limited by reducing the number of times a garment is washed – freshening items up by airing, as opposed to washing, where possible – and sorting laundry into colours and fibre types before washing.
- Consumers can be encouraged to consider washing by hand, steam-cleaning wool fabrics and removing stains with a liquid detergent rather than washing the whole garment.
- Consumers are often receptive to warnings about the potential impact of not following care instructions – such as the risk of shrinkage if garments are washed at too high a temperature, or the risk of white t-shirts becoming discoloured if washed with dark items.
- Home repair kits – including correct-coloured thread, spare buttons and other components, as well as instructions – could encourage consumers to make small repairs to particularly cherished garments.



**A considered approach to laundering will promote garment longevity**

## Recommendations on re-use and discard

While some casualwear garments are damaged and therefore not suitable for re-use, many are discarded when still wearable. There are therefore plenty of opportunities for garments to be resold, passed on to friends or family, donated to charity or taken to events such as swishing.

- Retailers can help raise awareness of this by providing advice on the labels and their websites about options for re-use.
- Garments that no longer look good can still be used for outdoor activities such as gardening.
- Worn-out clothing can be recycled – but many consumers are relatively unaware of this. Retailers can therefore provide information about this possibility too.
- 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.



**Advice on re-use and recycling reduces waste**

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# Guidance on design for longevity – childrenswear

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

## Product overview

- This category covers clothing for children from babies to teenagers, including schoolwear, nightwear, trousers, skirts, t-shirts, coats, knitwear, party clothes and fancy dress.
- Children are often physically active and so require comfortable clothes that enable them to move freely.
- Childrenswear therefore needs to be practical and hard-wearing, so the quality of raw materials and garment construction is especially important.
- It is also important that strong quality assurance systems are in place and adhered to.
- Many consumers engage in sharing and swapping childrenswear and passing on items for re-use – another reason for emphasising quality. Parents often expect that children will outgrow their clothes before they have become worn out.
- There may be business opportunities for suppliers around 'buy back and resale' or hiring schemes.

## Top five solutions

- Designing in a growth allowance.
- Selecting fabrics and components that are proven to offer durability and colourfastness.
- Applying fabric finishes to reduce the likelihood of staining.
- Designing garments for multi-functionality (such as reversible coats).
- Reinforcing weak areas, or areas liable to extra stress such as elbows and knees.

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## What limits lifetime?

Childrenswear is typically disposed of because either the child outgrows it or an item becomes worn with heavy use.

- Children quickly outgrow clothes , especially if there is no built-in adjustability.
- Garments are washed frequently. This weakens the fabric and can cause fading, giving it a worn appearance.
- Shrinkage can occur if garments are washed at excessively high temperatures.
- Fabrics aren't durable enough for the intensity of wear.
- Substandard components (zips, buttons etc.) can fail and seams break due to the use of lower quality components or threads – and people either can't, or choose not to, repair them.
- Fashion-conscious teenagers buy cheap items that are often of lower quality, which are then readily replaced when they fall out of fashion.

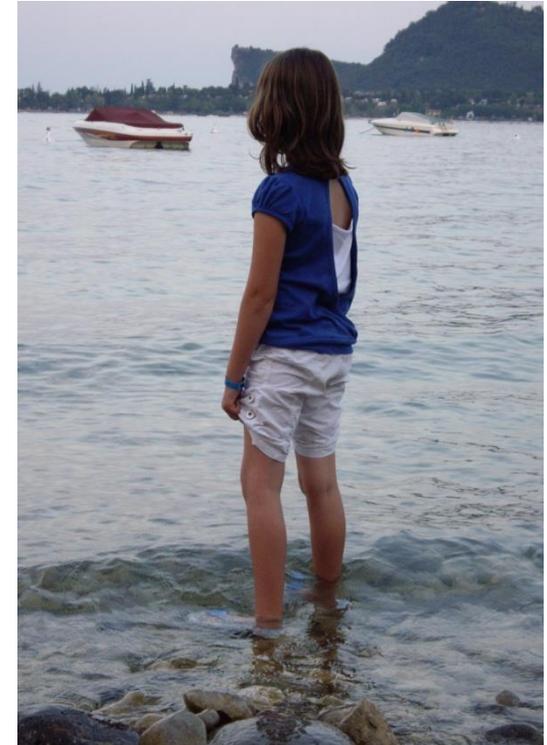
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## Recommendations on fibre and fabrics

Choosing the right fabric and trims can have a significant impact on the durability of childrenswear, which often needs to be more hard-wearing than adult equivalents. Fabrics need to be chosen to reflect the likely end use.

- Testing fabrics for durability, colourfastness and pilling not only meets safety requirements but can also help produce longer-lasting garments. Testing can be conducted prior to production and at various stages of production.
- If using fabrics susceptible to shrinkage (e.g. cotton, wool), consider using pre-shrinking treatments prior to production.
- Fabric finishes to help withstand stains are very useful as childrenswear is especially liable to soiling.
- Elastomeric yarns within fabrics can help them recover from stretching and minimise loss of shape.
- Wearer trials are highly recommended to find out the suitability of a garment in relation to its end use and ensure that quality issues such as durability and colourfastness to laundering are identified prior to delivery into store.

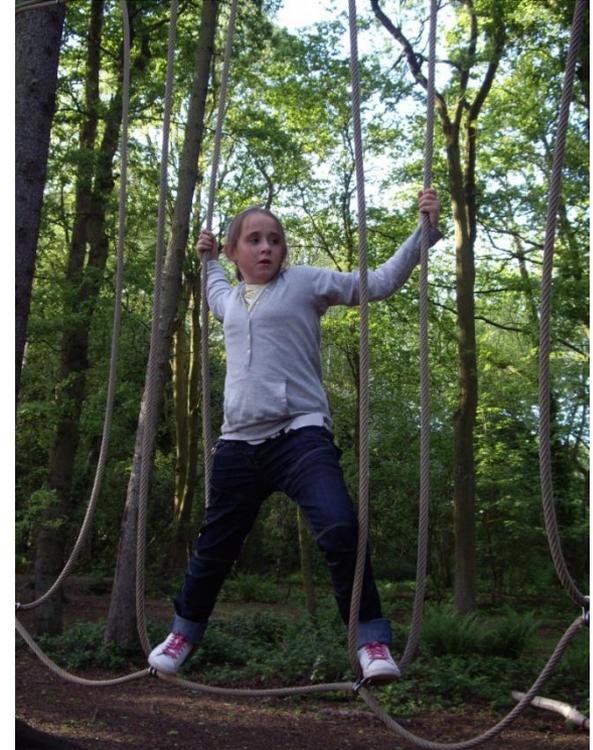


**It is good practice to test fabrics used in childrenswear for colourfastness**

## Recommendations on design and manufacture

The fundamental issue for childrenswear design is that there are two distinct audiences: children themselves, and parents. Product development teams need to address the priorities and interest of both.

- By designing-in growth allowance for both width and length, longevity can be increased. Options include elastic waistbands and generous hem allowances: sleeve and trouser lengths could have turn-up hems that could be let out when growth occurs.
- Children's heads are generally large in proportion to their bodies. This is important to consider when designing necklines.
- Reinforcing areas such as elbows or knees that are weaker or liable to heavy stress can increase lifespan. For example, patches could be applied or provided.
- Multi-functional garments can increase usage before the child outgrows them. For example, reversible coats, t-shirts that may be worn as pyjamas, and long loose shirts that can be worn as a dress all give more options for wear.
- Components such as buttons need to be attached strongly. There are a number of tests that can be applied, such as the EU childrenswear pull test.
- Designers can also influence longevity by creating garments that can be easily repaired when damaged or worn.



**Durability is a key consideration when designing longevity for children's garments**

## Recommendations on care and repair

Both children and parents can benefit from advice and encouragement to look after their garments by using appropriate laundering and storage practices. As well as focusing on 'easy care', there is an important message to 'keep caring' – encouraging and facilitating repair or promoting alteration or after-sales services.

- Childrens' clothes are often soiled relatively quickly and may require frequent laundering. However, where possible, it is worth encouraging children to wear clothes several times before they are washed – which may require educating parents so they understand that it is not always necessary to wash after every use.
- To encourage parents to make small repairs, swing tickets can recommend sewing loose buttons and small tears in seams, and include suggestions on how to customise garments, along with off-cuts of fabric and threads.
- Matching thread and spare buttons and other components can be supplied with garments.
- Children themselves can play an important role in looking after their clothes. Child-friendly care advice, such as suggestions for how to hang or fold clothes, can encourage them to do so – and impress good practices upon them.
- Sewing factsheets and repair kits aimed at children can enable them to learn these skills.
- As specialist skills and machinery may be required for major repairs, there is a commercial opportunity to either develop specialist aftercare services or identify companies to recommend to customers.



**Children's clothes may require frequent laundering**

## Recommendations on re-use and discard

There is a strong tradition of re-use of children’s clothes, whether handed down to siblings, passed to friends or wider family, or given to charity. Parents expect that children will outgrow their clothes before they have become worn out.

- The clothing industry can support re-use particularly with wider guidance beyond simply passing clothing to siblings. Retailers’ websites could provide consumers with advice about resale opportunities and how run a swap or swishing event, as well as what to do with items that are worn out.
- Adjustable features and elements not only mean clothing can ‘grow’ as the child does, but also help items to fit a wider range of shapes and sizes when passed on.
- Garments designed in classic styles and colours are more likely to be re-used. This is particularly important for schoolwear.
- Garment design can also 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.
- To encourage recycling, children can be offered visits to recycling or waste management facilities.



4120 By hoyasmeg

**Getting taller: growth is a key reason for discard**

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# Guidance on design for longevity – denim

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

## Product overview

- Denim encompasses not only jeans, but also denim jackets, dresses, shirts and skirts.
- Denim is naturally associated with longevity, both because it is a hard-wearing fabric – originally developed for workwear – and because discolouration and even damage that would be unacceptable in other garments is welcomed.
- Classic cuts using high-quality traditional denim or customised fitted and finished garments are generally kept for longer than high fashion pieces.
- Higher quality of raw materials, specialist finishes and construction methods can facilitate extended use and re-use.
- Unlike other garment categories, the price of denim does not always directly correlate with consumer expectations of wear.

## Top five solutions

- Using ozone bleaching, laser engraving and resin finishes to create the desired effects with a lower environmental impact.
- Enhancing fabric strength and surface quality by applying sustainable dyeing, bleaching and surface treatments.
- Applying traditional, robust manufacturing methods and mass customisation strategies to products.
- Educating consumers about the unique characteristics of denim and how to care for it and repair, re-use or repurpose it.
- Creating emotional attachment through ethical sourcing and production, no waste and craft design approaches.

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## What limits lifetime?

The fabric and component quality of denim garments has deteriorated over recent years due to demand for cheap clothing and easy care laundering.

- When garments are washed at too high a temperature, the colour can fade or the fabric thin, so they no longer have the desired appearance or feel.
- Cheaper denim, often made with blended fabrics, can become baggy through washing.
- Abrasion and fraying of denim fabric at key stress points (such as knees, elbows, hems and collars) can make denim look too worn.
- Element failure, such as the pocket coming unstitched or its lining tearing, or component failure, such as damage to a zips, rivets, fly buttons or fastenings, all reduce lifespan: items are more likely to be discarded than repaired.
- When fashions change, some garments are deemed unfashionable in terms of cut, style, colour or finish.

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## Recommendations on fibre and fabrics

The durability of denim products is directly influenced by fabric selection, manufacture, dyeing and finishing treatments.

- Denim with an unwashed weight of 12-14oz is generally deemed to offer the best durability for jeans.
- Factors such as twill design and steepness, and the use of other fibres (e.g. lyocell) and open-end or ring-spun yarns within fabric composition, can enhance durability and handle.
- New techniques such as laser engraving, enzyme and sustainable 'ozone' bleach treatments can create similar effects to stonewashing or sandblasting, but damage the fabric less.
- Resin fabric finishes can be applied to jeans to promote resistance to abrasion.
- Sustainably sourced and organic denim, and ethical manufacturing processes, offer a way to stand out in the market and increase user-product attachment.
- Zero-waste design approaches, that strategically incorporate otherwise wasted fabric into garments in order to reinforce physical durability, can lead to increased desirability.
- It is important to test fabrics for dry and wet rub, abrasion resistance, tensile strength, tear strength and seam slippage – and conduct similar tests on finished garments, including batch checking.



**Laser engraving and sustainable bleaching treatments enhance garment design and fabric strength**

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## Recommendations on design and manufacture

Cut and choice of fabric and trims and method of manufacture have a significant impact on the durability of denim garments.

- Classic cuts and styles remain highly popular – in line with the overall narrative of longevity.
- There is a growing market for customised fits.
- Innovative cuts, finishes and surface treatments can create investment pieces that appeal to the high fashion consumer.
- Blue remains the most popular colour for denim, but buying patterns vary with the seasons; darker shades are more popular in autumn/winter.
- Coloured denim can be used as seasonal highlights that work with staple pieces.
- There is a wealth of knowledge to draw on in terms of manufacturing processes and technologies. For example, it is recognised that the multi-thread chain stitch 401 creates extensible seams which do not pucker and have inherent elasticity – ideal for close-fitting styles made from fabrics blended with elastomeric yarns.
- Key abrasion points such as knees, elbows and collars can be reinforced with extra fabric or surface detailing as a design feature – while also increasing longevity.



**The integration of no waste and deconstructed features can encourage future transformation**

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## Recommendations on care and repair

Even though it is hard-wearing, washing and wearing affect the handle and appearance of denim. As consumers often have preferences about how 'worn' they like their denim to be, it is in the retailer's best interest to assist them to achieve this.

- Care instructions on labels need to be specific to the design, dye and finish of the garment, and acknowledge the likelihood of continuous colour loss and other expected changes to appearance through wear and laundering.
- Colour loss can be minimised by washing inside-out, at low temperatures and with minimal detergent.
- Care instructions can also highlight that denim garments can be refreshed by airing or steam ironing between wears; they can also be dry-cleaned.
- Although wear marks and holes are often seen as part of the garment's 'history' , there is some interest in making minor repairs – such as patching, or replacing elements such as collars and pockets.
- Home repair kits – including correct-coloured yarn and thread, spare buttons and other components, as well as instructions – could encourage consumers to make small repairs themselves.
- As specialist skills and machinery may be required for more complex repairs and alterations, there is an opportunity to develop specialist aftercare services or identify companies to recommend to customers.



**By encouraging home repairs and alterations garment longevity can be increased**

## Recommendations on re-use and discard

Denim's longevity opens up a lot of opportunities for re-use.

- Garments can also be passed on as second-hand to friends and family or through donation to charity shops.
- There are also opportunities to resell garments online or through vintage outlets. Retailers can help raise awareness of this by providing advice on the labels and their websites about options for re-use.
- Garments can also be altered or re-styled as fashions change, or if parts of an item become unwearable. For example, jeans can be turned into skirts or shorts; alterations to seams can create more fitted or looser silhouettes; garments can be readily customised with patches or embellishments.
- There is potential for retailers to create significant value by offering or promoting specialist alteration services.
- Worn-out garments can be 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.



**Denim garments can be customised or patch-worked to create new statement pieces**

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# Guidance on design for longevity – knitwear

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

## Product overview

- Knitwear refers to manufactured styles produced by weft knitting, including jumpers, cardigans and dresses.
- Designers require specialist knowledge of the key stages in the lifecycle of knitwear garments: choice of fibre, yarn production, manufacture of knitting fabric, garment construction and consumer end use.
- The quality of yarn, colours, shape, make-up and aftercare instructions, specifically linked to type of fibre, will influence the life-span of knitwear.
- Knitwear is often seen as an investment piece due to the high level of skill and craftsmanship required to produce the garment.
- Appropriate laundering of knitwear is particularly important as it is susceptible to shrinkage and becoming misshapen.

## Top five solutions

- Using quality yarn and fibres to improve the strength and colourfastness of knitted garments.
- Ensuring care and laundry advice is clear and simple.
- Taking steps to preserve the quality of knitted fabric (including colourfastness) and garment manufacture throughout production.
- Providing guidance for use and design in re-use and encourage consumers to downcycle old garments.
- Focusing on classic design and loose shapes.

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## What limits lifetime?

Knitwear is more liable than many other garment categories to distortion, shrinkage, shape loss, pilling and felting. This means garments either become unwearable, or stop looking good.

- These issues are worse in items made using poor quality processes or substandard raw materials, which are more likely to lose shape, shrink or suffer from pilling.
- Knitwear is also damaged by incorrect laundry and aftercare practices.
- When washed at high temperatures, shrinkage and felting can occur.
- Pilling occurs when items are worn or washed too frequently.
- Garments can lose their shape during storage when hung rather than folded.
- Like other garments, knitwear can become outdated when fashions change.

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## Recommendations on fibre and fabrics

The use of high-quality fibres, yarns and fabric is especially important for knitwear if garments are to be long-lasting.

- Elastomeric yarns in knitted structures can enhance the recovery of stretch fabrics, particularly at cuff and hem ribs.
- Acrylic yarns, though less luxurious in terms of feel, can produce long-lasting garments and are inexpensive and hard-wearing.
- Fibre dyeing can sometimes be used in preference to yarn dyeing for assurance of colourfastness when using some types of fibre (i.e. wool or cotton).
- Pre-shrinking treatments may be applied to the fabric as a finishing process.
- Pilling can be prevented or minimised by selecting yarns with longer fibres, and avoiding blended fibres.
- As well as selecting fibres, designers can also specify fabric tensions and qualities, including wales and courses.
- Once standards are set, testing at various stages of production can help ensure the quality of the garments is maintained.



**Good quality knitted fabric is important for longevity**

## Recommendations on design and manufacture

Designing knitwear for longevity is a question of attention to the smallest details as well as overall shape and style.

- Classic colours and marl effects, high-quality fine and chunky plain and ribbed knits and traditional stitch patterns (such as Fair Isle and Arran) can all encourage longevity.
- Oversized, loose and fitted shapes are also all identified as being likely to lead longer patterns of wear. Looser fits allow for fluctuations in body shape.
- Designing-in adjustable features or creating multi-functional garments (e.g. dresses that can be worn as jumpers) can help extend lifetime.
- Seams, trims and components need to be considered as part of the overall design and meet the same quality standards as the other components and processes. Particular care is needed to ensure that trims and components are properly attached.
- To minimise seam breakage, consider cup seaming; where overlocking is used, for price reasons, follow guidance on required stitches per inch.
- Emerging knitting technology allows the production of seamless garments – reducing the risk of seam breakage but also offering benefits in terms of style, comfort and fit.
- Once design specifications are set, specification sheets can be produced for use at all stages of manufacture to ensure quality construction. Quality control checks as part of the overall production process can also refer to these.

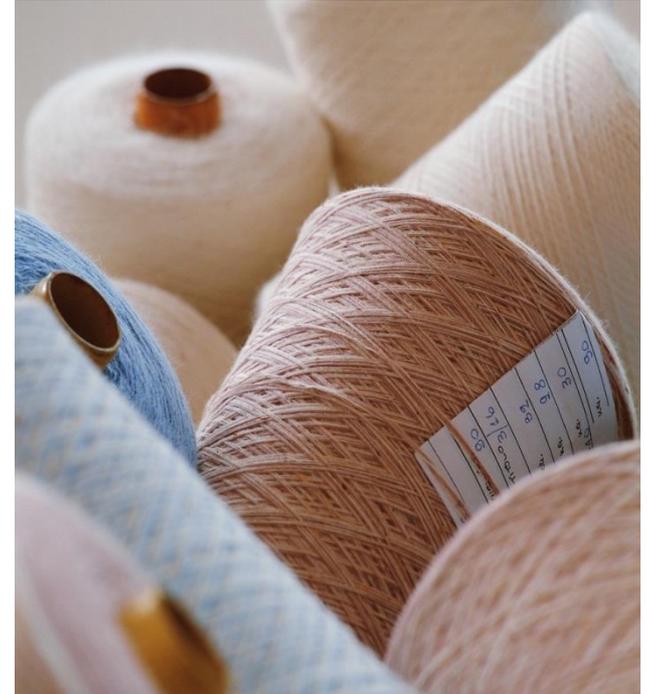


**Knitting technology for seamless garments**

## Recommendations on care and repair

Because knitwear is so easily damaged by washing, drying or storage practices, consumers need advice and encouragement to look after their garments appropriately and so increase longevity.

- Advice on care labels could be complemented by more detailed information in other formats, such as swing tickets or via websites.
- Information could include step-by-step guidance on reshaping whilst damp, or explanations of why washing too frequently damages knitwear.
- As well as instructions on washing and drying, there may be value in providing information on how to store knitwear.
- Specialist care tools such as pilling removal tools could be included with garments.
- Home repair kits – including correct-coloured yarn and thread, spare buttons and other components, as well as instructions – could encourage consumers to make small repairs themselves.
- As specialist skills and machinery may be required for repairs and alterations, there is an opportunity to develop specialist aftercare services or identify companies (or community-based initiatives) to recommend to customers.



**For minor repairs, supply yarn for mending**

## Recommendations on re-use and discard

Re-use is preferable to discarding when items are in a reasonable condition. Product development teams can facilitate re-use by considering it at the design stage.

- Knitwear is commonly resold or reused, even when it has shrunk or become slightly misshapen.
- Garments that no longer look good can still be used for outdoor activities such as gardening.
- There is also potential demand for higher quality knitwear for resale, creating possible business opportunities to develop 'buy back and resale' schemes.
- Retailers can facilitate this by providing advice and guidance for consumers on their websites, or on garment labels, encouraging customers to give unwanted knitwear to charity or pass it on to others.
- Worn-out knitwear can be 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.



**Old garments can be used for purposes like gardening**

This is one of a series of Guidance Notes for product development teams offering guidance on design for longevity.

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# Guidance on design for longevity – occasionwear

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

## Product overview

- Occasionwear refers to clothes that are worn for special events and occasions. It includes bridal wear, dinner jackets, evening wear, party dresses and high-quality suits.
- Occasionwear garments often command a premium price – which may mean that consumers expect them to be of higher quality and to last longer.
- Occasionwear is worn infrequently, but garments are often retained unworn in wardrobes for long periods, sometimes being kept for sentimental value.
- Many occasionwear items require specialist care in terms of hanging and cleaning.
- There may be unrealised opportunities for hiring or leasing garments of this type due to their infrequent use.

## Top five solutions

- Using classic styles, innovatively, to help transcend fashion fads.
- Ensuring high quality fabrics are used when designing garments.
- Designing garments that are multi-functional, to give the customer the option to wear different parts of the outfit with other clothes.
- Facilitating alteration through adjustable waistbands, generous seams or additional buttons.
- Selecting materials and components that can withstand the chemicals used in the dry-cleaning process.

*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.*

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## What limits lifetime?

There are essentially two key, yet contrasting, reasons that limit lifetime of occasionwear: the fact that it is worn infrequently, which has various consequences listed below, and the fact that it involves delicate materials which can be easily damaged.

- During the long gaps between wears, the owner's body size or shape may change, so garments no longer fit.
- Infrequently worn occasionwear becomes dated or unfashionable in appearance over time.
- Sometimes, people discard items simply because they have not worn them for so long.
- Occasionwear is often made from delicate fabrics and so can be snagged, torn or subject to pile loss. This can happen during wear – with spillage also a risk – in storage or due to inappropriate dry cleaning or laundering.
- Repairing damaged occasionwear is often either deemed uneconomical or is not technically feasible.

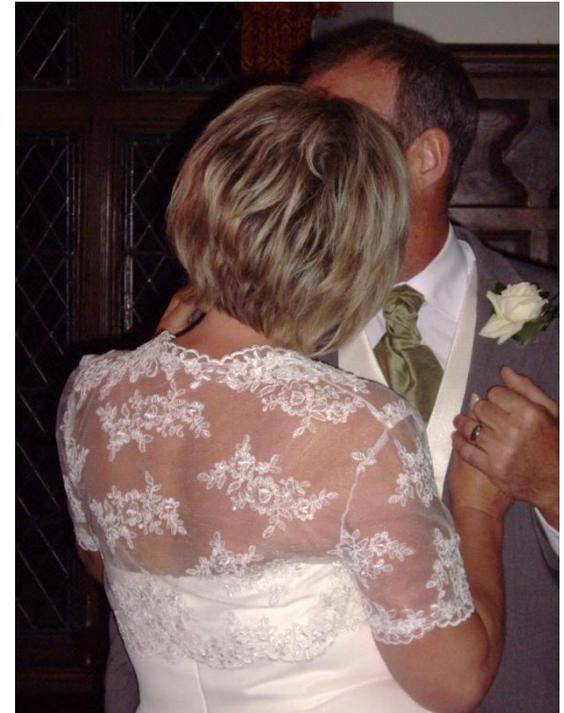
*Around **30%**  
of clothing waste  
ends up in landfill.*

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

## Recommendations on fibre and fabrics

Occasionwear affords the opportunity for detailed make-up, the use of luxurious fabrics, surface decoration and embellishment, and opulent trims.

- The fabric range used in occasionwear is extensive, with choice of fibre and fabrics often driven by appearance and handle.
- To minimise the risk of damage to these delicate fabrics, designers can select higher quality weaves (e.g. for satin to reduce snagging) or stipulate quality (e.g. of velvet to reduce pilling).
- Finishing such as embroidering, trims such as sequins, and motifs are associated with occasionwear. As much care needs to be given to sourcing these elements as the main fabrics, as damage to finishes and components can lead to garments being thrown away or returned to store.
- Pilot testing of fully made garments – including all finishes and linings – can provide an insight into robustness.
- Fabric-specific care advice is particularly important for consumers.
- Before applying anti-soil finishes, it's worth checking with fabric suppliers what the impact might be on the fabric.



**Embellishment is often associated with occasionwear**

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## Recommendations on design and manufacture

Design can help increase longevity in two fundamental ways – by focusing on quality so garments last for longer, and by enabling consumers to wear items more frequently and so get more use out of them before discard

- Because there are often long gaps between wears, people's body size or weight may fluctuate. This can be addressed through design for ease of alteration (e.g. including adjustable waistbands, generous seams or additional buttons ) and by focusing on flattering fits.
- Classic styles and colours help transcend fashion fads and mean an item is more likely to be re-worn when fashions change.
- Trend colours can be introduced as highlights for embellishments, buttons and styling.
- Garments can be designed to be worn in more than one way – or have detachable parts so that the design can be simplified or worn on less formal occasions. Possibilities include co-ordinating separates or layering.
- Garments can be sold with accessories that help transform their look – such as costume jewellery, scarves or belts that change an outfit from formal wear to day wear.

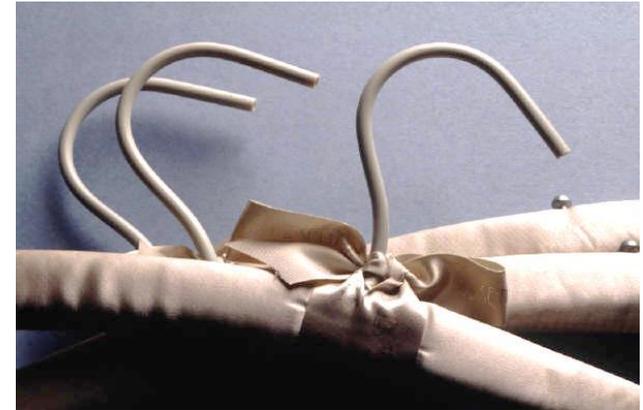


**Design for multi function through layering of separates**

## Recommendations on care and repair

Occasionwear is not subject to the stresses and strains of products worn day-to-day and garments tend to be less frequently cleaned, but extra care is needed to maintain the look and fit because of their delicate nature. Therefore accurate, detailed and specific care advice is particularly important.

- Where garments need dry cleaning, it is worth reminding consumers that this should be done only when necessary – using airing instead as a means of freshening garments.
- Consumers may need reminding to wash or dry-clean co-ordinating products (e.g. both parts of a suit) together, and to remove accessories.
- Consumers may need to be warned to avoid rubbing stains, as this can damage the fabric, and not to use solvents for spot cleaning as they can cause discolouration.
- For fabrics that are susceptible to pulls – such as woven Jacquard and satin – additional advice may be needed both around wear and storage.
- In general, appropriate storage for occasionwear is important: it may be necessary to recommend the use of wooden or padded hangers and any loops provided on garments to maintain shape.
- To facilitate simple home repairs, spare buttons and matching thread can be provided as applicable.
- As specialist skills and machinery may be required for repairs and alterations, there is an opportunity to develop specialist aftercare services or identify companies to recommend to customers.

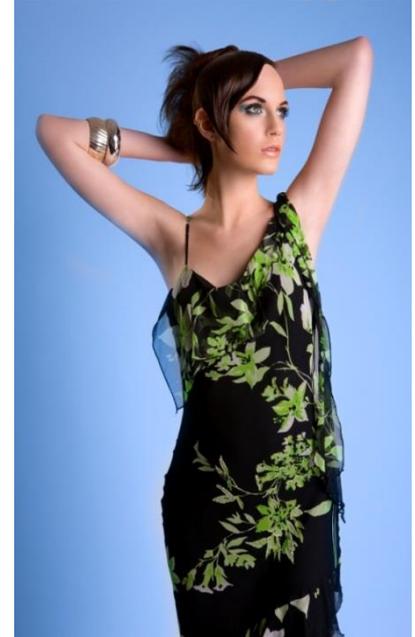


**Appropriate storage: use padded coat hangers for delicate fabrics.**

## Recommendations on re-use and discard

Re-use is preferable to discarding when items are in a reasonable condition. Product development teams can facilitate re-use by considering it at the design stage.

- Garments designed in classic styles and colours are more likely to be re-used, particularly where the design allows for modification.
- Vintage fashion offers a route to resale.
- Recent evidence has found a strong consumer interest in opportunities to hire occasionwear or formal wear, and in a 'buy back and resale' model, in which customers could return nearly new occasionwear to retailers for resale, receiving monetary rewards or store vouchers. Both routes offer consumers an opportunity to afford occasionwear they may not otherwise purchase.
- Other channels for re-use include online resale, charity shops and swap or swishing events. Retailers can provide advice on these on their own websites.
- Fabrics used in occasionwear can often be repurposed even when the item is no longer wearable. Consumer education may be needed to encourage them to give items up for recycling, rather than simply throwing them away.
- 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.



**Provide consumers with the option of leasing or hiring**

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# 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.*

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## 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.

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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.



Image: Lululemon athletica

**Water wicking property of fabric**

## 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.

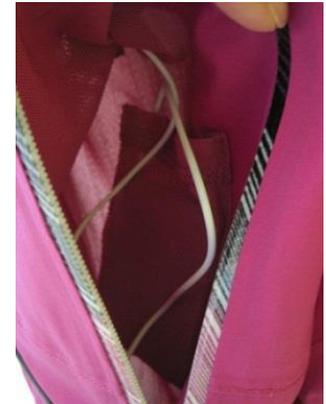


Image: Lululemon athletica

**Hidden pocket for music player**

## Recommendations 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.



Image: Lululemon athletica

**Hanging loop to prevent sportswear damage**

## 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.



Image: Nedrichards

Marathon vest with sentimental value

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# Guidance on design for longevity – tailoring

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

## Product overview

- Tailoring refers to formal wear such as suits, jackets, skirts, trousers and coats.
- It is related to certain types of occasionwear: the key difference is around frequency of wear. In this category, the focus is on items to be worn daily or many times in a week.
- Longevity is expected of tailoring, and is valued. Bespoke items are often long-lasting and handed down between generations, while mid-market tailored items may last several years.
- It is generally assumed that higher price points imply longer-lasting items – reflecting fabric quality and skill in construction.
- Tailored garments are generally less susceptible to fashion trends than other types of clothing.
- They tend to be discarded when they no longer fit or when they no longer look smart: however, they are less susceptible to wear and tear, staining etc. than many other categories.

## Top five solutions

- Using high quality outer fabric and ensuring lining and interlining are compatible.
- Applying classic styles, cut and colours, and building-in features to allow easy adjustment size and shape alteration.
- Including clear guidance and advice on the care label.
- Where possible utilising detachable elements, such as collars or linings, which can be replaced when worn.
- Providing a specialist aftercare service, as well as mending and repair advice.

*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.*

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## What limits lifetime?

Tailored garments are generally less susceptible to fashion trends than other types of clothing. They tend to be discarded because they no longer fit, or as a result of damage or wear and tear that affects appearance.

- Areas such as collars, cuffs and hems can become worn.
- Individual components like buttons or zips can break.
- The shape of garments can be distorted, or creasing or shrinkage can occur after washing or cleaning. This is a result of the different properties of the fabrics used as outer cloth and those used as linings.
- Changes in the body shape of the wearer can mean that items no longer fit, or no longer look as smart as required. This is a common issue when garments are unworn for long periods.

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of clothing waste  
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1.2 million tonnes,  
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## Recommendations on fibre and fabrics

Choice of fibre and fabrics has a major influence of the longevity of tailored garments. While decisions will depend on the price point of the garment, the general principle that higher quality fabrics last longer is particularly important for these items, where longevity is expected.

- Natural fibres such as wool or a silk or linen blend are generally considered a better choice for longevity than synthetics. Natural fibres tend to resist dirt and odour better.
- Where it is not commercially feasible to produce garments in 100% natural fibres, wool mixes generally offer the best quality for the price.
- Polyester blends will help with abrasion resistance and shape retention. Pure silk is not recommended.
- For woven fabrics, key criteria include a high tear strength and low seam slippage.
- Extensive testing is recommended, particularly around colourfastness against perspiration and in washing or dry cleaning. Wash tests are best conducted at 10 degrees higher than the wash temperature stated on the care label.
- When testing, it is important to consider not only the properties of each individual fabric, but also the combinations. In particular, testing can help identify where fabrics used as interlinings may not withstand the cleaning processes recommended for the outer cloth.



Image: Kellyhogaboom

**Quality suit fibre**

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## Recommendations on design and manufacture

The fundamental principle underpinning design and manufacture of tailoring is that customers expect longevity.

- Classic cuts and colours are recommended, rather than following fashion trends. This will increase overall longevity and frequency of wear.
- Seasonal colours can be used effectively as highlights, such as piping or contrast stitching, or for linings.
- Longevity can be further increased by designing items that can be easily adjusted and altered over time – for example, by including detachable elements, such as collars or linings, which can be replaced when worn.
- By designing-in features such as seam allowances, a choice of waist fastening widths, and the use of elastic in waistbands, designers can protect against changes in body shape. These features can be easily included in ready-to-wear garments.
- Mass manufacturing processes can adopt some of the practices of skilled tailors to increase lifespan – such as including interlinings to protect seams and preserve shape. Interlinings and top cloth need to be aligned in the same direction of the grain to avoid distortion.
- To ensure seam security, top-stitching for seams is recommended. Appropriate-size needles can prevent seam puckering, and minimise distortion of warp and weft yarns. Where garments are unlined, it is important to finish seams to avoid fraying.

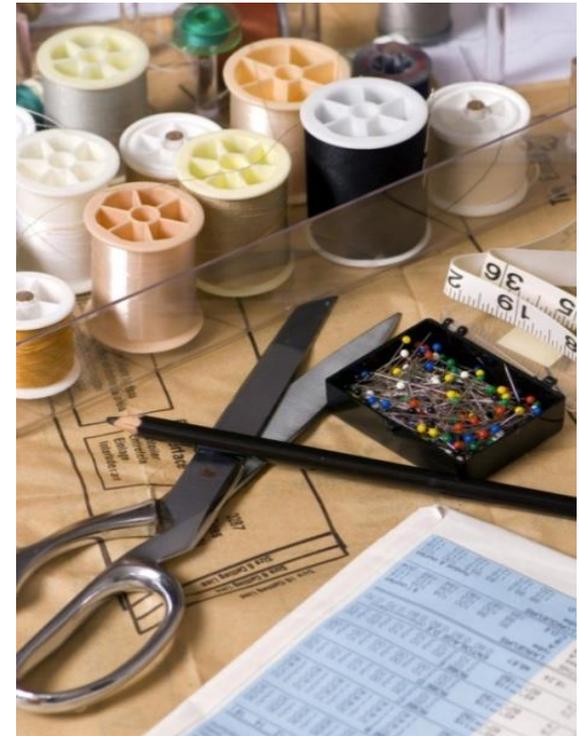


Manufacture of tailored garments

## Recommendations on care and repair

Because tailored garments are often purchased as investment pieces, with longevity in mind, consumers are potentially more receptive to messages around the correct care for the garments and options such as fitting, alteration and repair services.

- Accurate care instructions are essential – whether for dry-clean items (i.e. most wool items) or machine-washable garments.
- For dry-clean garments, there is an opportunity to encourage spot or steam cleaning, to remove minor stains and reduce the frequency of dry cleaning to prevent fibres from breaking down. Consumers may need guidance on how to spot or steam clean.
- To facilitate simple home repairs, spare buttons and matching thread can be provided as applicable.
- As specialist skills and machinery may be required for repairs and alterations, there is an opportunity to develop specialist aftercare services or identify companies to recommend to customers.



Useful tools for home repair of garments

## Recommendations on re-use and discard

Because tailored garments do last for a long time, there is a strong second-hand market for them, through charity or vintage shops.

- Retailers can provide advice on garment labels and their websites about options for re-use, including online resale, charity shops and swap or swishing events.
- Garments designed in classic styles and colours are more likely to be re-used, particularly where the design allows for modification.
- 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.
- There are also potential business opportunities to develop 'buy back and resale' or hire services for tailoring – drawing on the model used in men's occasionwear for the hire of wedding suits or dinner suits.



**Alteration of the garment when it no longer fits enables longevity**

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# Guidance on design for longevity – underwear

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

## Product overview

- Underwear includes bras, briefs, boxers, vests, slips, shapewear and thermals.
- Shapewear and bras are highly engineered products with many component parts, whereas briefs, slips and vests are simply constructed products with few parts.
- Good form, support, comfort and fit are pre-requisites when designing underwear.
- The daily use of underwear means that it must be able to withstand constant wearing and laundering.
- A balance is needed between style, colour, fit, comfort and how easy it is to launder when designing underwear.
- Opportunities for re-use are limited due to the personal nature of underwear.

## Top five solutions

- Using more durable fabrics, trims and construction methods.
- Removing seams where possible, and recognising that comfort is crucially important for prolonged daily wear.
- Scheduling in time for multiple fittings during the design process to ensure that underwear fits well and supports where necessary.
- Providing expert advice on fit on product packaging and at point of sale.
- Designing underwear to be easy to launder.

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## What limits lifetime?

Underwear is generally discarded when it no longer fits properly and so is uncomfortable.

- Discomfort and poor fit can be a problem from initial purchase onwards – particularly in the case of bras. This can lead to discard after relatively little use.
- Garments that rub or feel rough against the skin are likely to be worn less frequently or disposed of early.
- Underwear made from cotton or weft-knitted fabrics may shrink or become misshapen – again making the garments uncomfortable.
- Garments do not recover well from stretching. For example, if the waistband elastic in a pair of briefs becomes slack then consumers will throw them away, even though the fabric they are made from may still be serviceable.
- Though appearance is generally less of a reason for discard than discomfort, garments are often thrown away when fabrics fade or discolour. White or light coloured underwear is particularly liable to this.

*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

A range of fibre types are used for underwear including cotton, viscose, silk, polyester, polyamide and blends.

- Different fibres offer not only different aesthetic qualities but also different performance attributes. Some fibres and yarn types stretch better than others or are more resilient to washing.
- Fabric selection depends on expected end use. The fabric used in a sports bra, for instance, typically needs good stretch and recovery, excellent moisture management and a smooth handle.
- Micro-fibres and fabrics containing elastane can enhance comfort, fit and durability.
- Knitted fabrics may need to be relaxed to enable accurate sizing for spreading, cutting and sewing.
- Anti-static finishes may be of use when using man-made fibres that are prone to cling. It is important to check with fabric suppliers to ensure these finishes will not damage the fabric.
- If making underwear garments out of more than one fabric type, it is important to ensure that the fabric properties are well-matched.



**Select fabrics with good stretch and recovery properties for extended wear**

## Recommendations on design and manufacture

In designing underwear it is important to consider style, colour, fit, comfort and how easy it will be to launder – all of which encourage longevity.

- To ensure garments fit well, it may be worth allowing time for several fittings at different stages of the design and manufacture process, particularly for new styles of bras and foundation garments.
- Ensuring the best seam and stitch type is very important to ensure comfort and longevity. The margin of error on seam allowances is very small. It may be worth considering sewing trials with machines unthreaded to help with quality.
- Approaches that allow manufacture without seams (e.g. techniques such as seam free, laser, raw cut edges and moulded cups for bras) are beneficial.
- Frequency of wear can be increased by creating multi-way bras and underwear that can be worn as outerwear.
- Longevity can be increased by designing bras to accommodate an additional back hook and eye trim, which can be sold separately. This helps with increasing the comfort of the garment if the consumer's size or shape fluctuates.

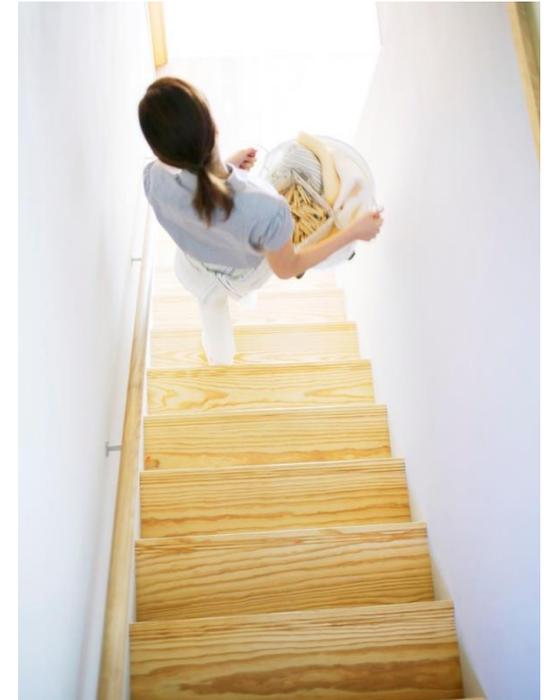


**Good fit and comfort are crucial design considerations**

## Recommendations on care and repair

Underwear generally requires relatively frequent laundering, so it is important to give customers the correct care advice. In general, this will involve hand or machine washing; ironing is not normally needed.

- Rigorous testing of pilot garments can help establish what the correct advice should be in terms of washing, drying and storage.
- Typical considerations include washing co-ordinating items (e.g. bras and briefs) together, using a lingerie wash bag for delicate items, washing deep colours together where appropriate and closing fastenings before washing in order to reduce the chance of these being caught on other garment parts.
- For silk garments, specialist detergents are generally recommended.
- Underwear garments that are constructed well are unlikely to need repair.
- It is unlikely that consumers will repair underwear unless the garment is a special occasion piece: there may be scope for an after-sales/repair service for such items.
- To minimise the risk of yellowing pre-sale, it is recommended to use BHT-free plastic bags for shipment and storage.



**Underwear requires frequent laundering**

## Re-use and discard

The intimate nature of underwear and the frequency of wear make it less likely to be re-used, so the focus should be on responsible disposal.

- Many consumers are relatively unaware of the possibility of recycling clothing, so may assume that items which 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.



**Unworn underwear may be passed on to others, while worn garments should be disposed of responsibly**

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](http://www.wrap.org.uk/clothing)

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