

## Improved Clothing Durability as a Lifespan Extension Strategy: A Framework for Measuring Clothing Durability

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**Abstract :** Garment durability, which encompasses physical and emotional factors, has been identified as a critical ingredient in producing clothing with increased lifespans, battling overconsumption, and subsequently tackling the catastrophic effects of climate change. Eco-design for Sustainable Products Regulation (ESPR) and Extended Producer Responsibility (EPR) schemes have been suggested and will be implemented across Europe and the UK which might require brands to declare a garment's durability credentials to be able to sell in that market. There is currently no consistent method of measuring the overall durability of a garment. Measuring the physical durability of garments is difficult and current assessment methods lack objectivity and reliability or don't reflect the complex nature of durability for different garment categories. This study presents a novel and reproducible methodology for testing and ranking the absolute durability of 5 commercially available garment types, Formal Trousers, Casual Trousers, Denim Jeans, Casual Leggings and Underwear. A total of 112 garments from 21 UK brands were assessed. Due to variations in end use, different factors were considered across the different garment categories when evaluating durability. A physical testing protocol was created, tailored to each category, to dictate the necessary test results needed to measure the absolute durability of the garments. Multiple durability factors were used to modulate the ranking as opposed to previous studies which only reported on single factors to evaluate durability. The garments in this study were donated by the signatories of the Waste Resource Action Programme's (WRAP) Textile 2030 initiative as part of their strategy to reduce the environmental impact of UK fashion. This methodology presents a consistent system for brands and policymakers to follow to measure and rank various garment type's physical durability. Furthermore, with such a methodology, the durability of garments can be measured and new standards for improving durability can be created to enhance utilisation and improve the sustainability of the clothing on the market.

**Keywords :** circularity, durability, garment testing, ranking

**Conference Title :** ICTCS 2025 : International Conference on Textiles and Clothing Sustainability

**Conference Location :** Ljubljana, Slovenia

**Conference Dates :** June 10-11, 2025