

## Do e-textiles for Fashion require specific Legislation and Developmental Guidelines in order to avoid Harmful Waste?

J. Saunders\*

London College of Fashion, University of the Arts, London, UK (\*j.saunders@fashion.arts.ac.uk)

**Key Words:** e-textiles, waste, legislation, design for disassembly, circular design

### 1. Research Gap Identified

E-textiles are a rapidly expanding body of materials, with extensive prototyping and market testing being carried out globally for fashion, military and medical applications. This is leading to novel combinations of nano materials, electrical components and fibers. A small number of researchers have identified the need for regulation and highlighted the potential environmental impact of e-textiles [1-3]. Partially covered by a myriad of directives and legislation within the EU and UK, there is a call for action to address the disposal and waste aspects of e-textiles [4][5]. The EU WEEE directive [6] instigated in 2006 to address electronic waste management provides clear and actionable outlines for electronic devices with emphasis on producer and user responsibilities. The same cannot be said for the complex directives and legislation relating to fashion and textile waste. The Pulse report [7] identifies the need for producer responsibility in fashion and the World Economic Forum [8] states there is currently no “credible” recycling for fast fashion, add e-textiles to fast fashion and the potential impact is chilling. The EU and UK have sought to explore the effects of nano-materials, however there is currently no specific direction on disposal of nano-composite materials other than to include it among REACH legislation [9]. This research addresses the gap within current textile, fashion apparel, electronics and nano-materials legislation.

### 2. Question (and Sub-question) answered

Does current legislation in the UK cover the disposal of e-textiles particularly in the fashion arena to such an extent that e-textile waste will not harm the environment in future? The research demonstrates that guidance and legislation is necessary specifically in relation to fashion e-textiles to avoid a future of clearing up toxic waste following their disposal. Having established the need for legislative review, this research forms the basis of a sustainable framework for e-textile waste legislation in the UK and subsequent white paper.

### 3. Methodology

Triangulate secondary research to develop a conceptual framework, test in workshops and interviews with key industry leaders, producers and researchers to establish viewpoints and individual needs, leading to discussion on a proposed framework and a legislation outline.

### 4. Results and Key Findings

This research has identified a gap in UK/ EU legislation regarding e-textiles and that there is a need for clarification.

### 5. Originality

The research indicates that there is no substantial legislation in the UK or EU in relation to the lifecycle and disposal of e-textiles and provides original insights into developing effective legislation.

### 6. Research Implications and Limitations

The research will contribute to the reduction or neutralisation of the environmental impact of the emerging e-textiles sector particularly in fashion apparel. Initially this will be UK wide but may inform legislation on an EU and global level. Bringing legislation together that specifies e-textiles will mean this exciting new breed of materials will not slip through legislative net and cause catastrophic environmental impact in the future.

### References

- [1] Köhler, A. R., Hilty, L. M. and Bakker, C. (2011) ‘Prospective Impacts of Electronic Textiles on Recycling and Disposal’, *Journal of Industrial Ecology*, 15(4), pp. 496–511. doi: [10.1111/j.1530-9290.2011.00358.x](https://doi.org/10.1111/j.1530-9290.2011.00358.x).
- [2] Köhler, A. R. (2013) ‘Challenges for eco-design of emerging technologies: The case of electronic textiles’, *Materials & Design*, 51, pp. 51–60. doi: [10.1016/j.matdes.2013.04.012](https://doi.org/10.1016/j.matdes.2013.04.012).
- [3] Veske, P. *et al.* (2019) ‘Environmental sustainability of e-textile products approached by makers and manufacturers’. Loughborough University. doi: [10.17028/rd.lboro.9724664.v1](https://doi.org/10.17028/rd.lboro.9724664.v1).
- [4] de Jesus, A. and Mendonça, S. (2017) ‘Drivers and barriers in the Eco-innovation road to the Circular Economy’. SPRU Working Paper Series, p.50.
- [5] Platform for Accelerating the Circular Economy (PACE) project [http://www3.weforum.org/docs/WEF\\_PACE\\_Platform\\_for\\_Accelerating\\_the\\_Circular\\_Economy.pdf](http://www3.weforum.org/docs/WEF_PACE_Platform_for_Accelerating_the_Circular_Economy.pdf)
- [6] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) Text with EEA relevance (2012) 197. Available at: <http://data.europa.eu/eli/dir/2012/19/oj/eng> (Accessed: 15 July 2020).
- [7] Global Fashion Agenda and The Boston Consulting Group, Inc. 2017 Pulse of the Fashion Industry
- [8] Ending the era of dirty textiles (2019) World Economic Forum. Available at: <https://www.weforum.org/agenda/2019/09/ending-the-era-of-dirty-textiles/> (Accessed: 9 November 2019).
- [9] Inc, C. (2019) ‘New REACH Nanomaterial Requirements: What You Need to Do’, Covance Blog, 5 November. Available at: <https://blog.covance.com/2019/11/new-reach-nanomaterial-requirements-what-you-need-to-do/> (Accessed: 19 February 2020)