

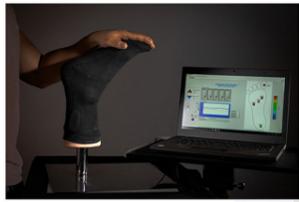
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Textile waste

300 kilotonnes of clothing sent to landfill in 2016 (WRAP, 2017)



Electronic textiles:
applications in fashion, sport, medicine, defence, leisure



Electronics waste

The fastest growing waste stream (Robinson 2009)

UK 2015: 2,001 kilotonnes of electrical and electronic goods marketed (WRAP, 2016, p. 27)



'A hybrid product that will likely exacerbate sustainability issues and complicate end-of-life treatment before manufacturing technology, legislation and infrastructure are sufficiently able to handle even traditional electronic or textile products.' (Köhler, 2013)

How can design, use and disposal of electronic textiles waste be made sustainable?

Literature review on the sustainability of electronic textiles

Electronics and textiles sectors:
high volume, low cost, and largely short-life products

Average product lifetimes:

Jacket: 5 years (Langley, Durkacz and Tanase, 2013);

Smartphone: 2 years (Baldé et al., 2017, p. 21),

so 'virtual wear-out' of electronic textiles could limit product lifetimes

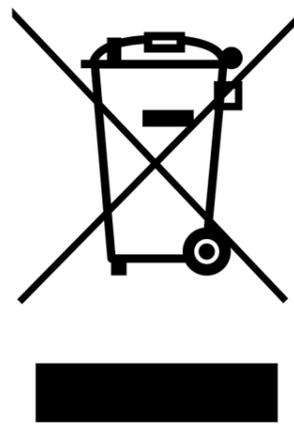
There is no waste processing stream for electronic textiles

The primary function of electronic textiles is often clothing, so disposal does not have to comply with the Waste Electrical and Electronic Equipment directive (European Parliament, 2012)

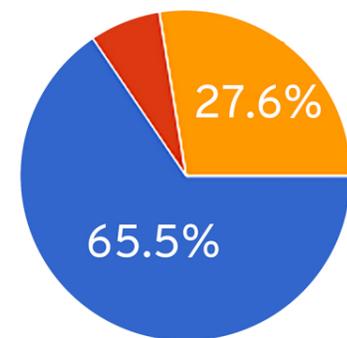
Incompatibility of E-textiles recycling requirements with existing take-back, recycling and disposal schemes (Köhler, 2008; Köhler, Hilty and Bakker, 2011)

Survey on disposal of electronics

Batteries are a source of hazardous substances



Do you recognise this symbol?



- Yes
- No
- Not sure

Teardown of electronics from a Christmas jumper



A sealed circuit board to provide light and sound

Batteries not replaceable



'Extant eco-design principles ... can be adopted from the electronics and the textiles sector but they must be further developed so as to fit with the specific properties of e-textiles.' (Köhler, 2013)

58 respondents

34.5% do not know or are unsure about the meaning of the the crossed wheellie bin symbol.

Initiatives are required to ensure that batteries are disposed of correctly.

Further work required to ensure that electronic textiles are disposed of correctly.



Next steps

Further teardowns, including the Levi's® Commuter™ Trucker jacket

Analysis of E-textile components

Interviews with waste disposal experts

Workshops on design and disposal

Development of design and disposal guidelines for electronic textiles



No recycling information for product or batteries

No information about the electronics on the garment labels

References

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