




**Best
practice
guide on
footwear
design for
recycling**

Re_fashion



Eco-design of a footwear product implies that the product's entire lifecycle is considered. When an eco-design strategy focuses on recycling, the elements that affect the possibility of recycling a product, i.e. the product's capacity to be recycled, need to be considered right from the design stage. Some elements can improve a product's recyclability (recycling facilitators) whilst others reduce it (recycling disruptors).

Footwear recycling may cover the sole (outsole), the shoe upper or the entire shoe. Currently, footwear sole recycling is more advanced; **therefore efforts in eco-design should focus on the sole.** Best practice in designing the footwear's upper or the entire piece of footwear is obviously necessary to streamline and sustain large-scale recycling of footwear.

NB: If the footwear's upper is made from fabric, please refer to the Best practice guide on textile design for recycling.

Warning: a product's durability (i.e. ensuring that it can be used for as long as possible) must remain the overriding driver in design, even before that of improving its recyclability. Nevertheless, certain elements considered as recycling disruptors remain essential in order for the product to function properly, for it to be comfortable or for its durability. Therefore, it is not advised to remove these elements or replace them with less efficient or less durable alternatives.

Recycling disruptors

External disruptors

External disruptors, including “hard points” are elements which can be removed from footwear during a recycling preprocessing stage called “disassembly”.

These disruptors are sometimes essential but can be limited in number. Also, grouping them together in the same place on a product can facilitate their removal.

List of external disruptors:



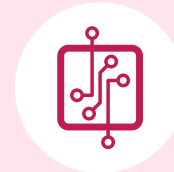
Fasteners	Information transmitters	Functional elements	Aesthetic elements	Removables electrical and electronic components
<ul style="list-style-type: none"> • Zip/zipper • Button • Hook and eye fastener • Buckle • Clasp • Snap fastener • Snap hook • Brandenburg button/toggle closure • Braiding/ String/cord • Eyelet • etc. 	<ul style="list-style-type: none"> • Brand label • RFID chip • etc. 	<ul style="list-style-type: none"> • Reflective strip • Elastic • Ring • Shank • Heel grip • Hard toe-puff, toe-shell, and puncture-proof plate • etc. 	<ul style="list-style-type: none"> • Rhinestone, Spangles / Paillettes / Glitter • Embroidery • Stud, Rivet • Pompom • Badge, Patch • Flexible or Rigid plate • Lace • Bead • Bow • Charm 	<ul style="list-style-type: none"> • LED light • «Smart” sensor • Heating device • etc.

This non-exhaustive list of external disruptors is given for information purposes only. Some elements may be both aesthetic and functional.

Internal disruptors

Internal disruptors are elements that cannot be separated from the product. They are integrated or inherently linked to the sole, the shoe upper or the footwear product. These disruptors are therefore more problematic than external disruptors. **It is recommended to avoid using them** (or at least to limit them) during the product's design phase

List of internal disruptors:



Finished product	Finishing	Non-removable electrical and electronic components
<ul style="list-style-type: none"> • Multimaterial (>2)* • All-over decorative element (print, sequins, glitter, paillettes, etc.) • Upper-to-sole stitching • Adhesive • etc. 	<ul style="list-style-type: none"> • Coating • Chemical finish • Carbon black dyeing • etc. 	<ul style="list-style-type: none"> • LED light • "Smart" sensor • Heating device • etc.

**Product final composition with more than 2 different materials.*

This non-exhaustive list of internal disruptors is given for information purposes only.

Recycling facilitators

Recycling facilitators are a range of elements that help in recycling and have a positive impact on at least one footwear recycling stage. The most impactful facilitators are highlighted **in bold**.

List of facilitators:



Shoe upper	Sole	Finished product
<ul style="list-style-type: none"> • Single material • No decorative elements 	<ul style="list-style-type: none"> • Single material and one piece design • Sole fastened with hot-melt adhesive or yarn • No decorative elements 	<ul style="list-style-type: none"> • Traceability and communication of precise material composition • Single materials

If part of the footwear is in textile, please refer to Best practice guide on textiles design for recycling. NB: This list is valid at the time of publication and will be updated according to developments in the recycling industry.

In summary, **footwear that can be more easily recycled today is footwear combining** the following two criteria:

- **Single-material AND one-piece sole ;**
- **Single-material upper without any finishes or hard points.**

Any item combining these criteria could theoretically be recycled once the shoe upper and sole have been separated and provided that the materials have been correctly identified and that recycling processes exist.

To make footwear recycling easier, it is recommended:

- **that throughout the product lifecycle, information about its composition** (essentially material composition) **is provided and can be traced;**
- **to introduce a minimum of recycling disruptors** (electrical or electronic components, hard points);
- **to opt for single-material products** (or as a minimum a single-material shoe upper and a single-material one-piece sole)
- **to opt for shoe upper-to-sole assembly that uses a hot-melt adhesive or yarn** (provided that this does not affect the product's durability).

For further details, we invite you to refer to Refashion's full study entitled [Study on recycling disruptors and facilitators in clothing, household linen and footwear - 2025](#)



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