

# Materials of Fashion

From  
Analogue  
Principles  
to  
Hybrid  
Practices

*Dorothea Mink*

INTRO-  
DUCTION

*Ursula Zillig*

FOUND-  
ATIONS

*Anna Hadzelek*

RE-SHIRT:  
Brand New  
Temporary  
Prints

*Aart van Bezooijen,  
Paula Raché*

A Possible  
Role For DIY  
Materials  
in Prototyping  
Sustainable  
Futures

*Charlett Wenig, Johanna  
Hebemeyer-Cürten*

The Bark  
Project  
– Materials  
Research  
across Design  
and Natural  
Sciences

*Carolin Pertsch*

Material as  
a Hybrid  
Experiment

*Julia Catrin Eberhardt*

INTER/  
SECTIONS  
– Creating  
and  
Investigating  
Sartorial  
Culture

*Katja Bernert*

Think Outside  
the Box:  
Using Textiles  
in Between  
the  
Dimensions  
of a Blouse  
and a House

*Matilde Frank*

Textile  
Patterns:  
Exploring  
Identity,  
Culture,  
and Design

*Karen van Godtsenhoven*

Fashion  
Creation as  
an Embodied  
Practice: of  
the Kimono,  
Patterns, and  
the Space  
in-between

*Franziska  
Müller-Reißmann*

METABOLISM  
– 'Sustainable  
Materials' in  
Design & Art

# META- BOLISM – 'Sustainable Materials' in Design & Art

Author: *Franziska Müller-Reissmann*

Title: METABOLISM ~ 'Sustainable Materials' in Design & Art

Copyright: *University of the Arts Bremen, Franziska Müller-Reissmann*

Translator: *Andreas Mink*

Number of Characters: 14.079 (*without spaces*), 19.866 (*with spaces*)

Number of Words: 2.138

Number of Images: 4

Short Bio of the author: *Franziska Müller-Reissmann heads the material collection at the Zurich University of the Arts and coordinates the content of the Swiss Section of the Material Archive. The art historian and former carpenter teaches and researches material aesthetics and sustainability at the Departments for Design and Art Education at the ZHdK. In addition, she works with museums and designs exhibitions on material-related topics in design.*

[www.materialarchiv.ch](http://www.materialarchiv.ch)

Whenever the concepts of sustainability and recycling meet, the discussion tends to focus on a metabolism. Three different aspects appear: the biological meaning of the term – namely material transformations – are questioned, both in the sense of material recycling, but also with regard to undesirable distributions of substances in the environment.<sup>01</sup> Secondly, metabolism can refer to actions such as the treatment and processing of materials, for example, in art theory in the 19th century.<sup>02</sup> Describing the role of materials as a style-forming counterpart and thus as an active one, has enriched the relationship between matter and form by examining their interaction. Such a focus on the dynamics and interweaving of materials and aesthetics is currently popular in the wake of new materialist approaches.<sup>03</sup>

And thirdly, materials traditionally used for works in design and the arts, construction and packaging, as well as for fashion and consumption, are being questioned in broad social debates as well as in transdisciplinary, academic discourses today. There are demands for metabolism in the sense of replacement and ‚sustainable materials‘ are proposed as substitutes and thus as problem solvers.

The perspective of this text grew from my work in a material collection at the Zurich University of the Arts, in which sensual and theoretical approaches to materiality and material aesthetics are conveyed at the interface of issues in design and art studies.

**ILL-1** The contents of the collection are intended to provide access to material creation. It is a place for questioning materials about their creation and their relationships: How are they related to each other, to the world and to design and the arts?

Various, differently manufactured samples show material states ranging from so-called natural materials to the results of student material experiments to DIN-standardised materials and semi-finished products. The material samples are made available to students and lecturers as media in changing presentations and organisational systems, and are linked to digital background information from the materialarchiv.ch database.<sup>04</sup>

01 The term "metabolism" ('Stoffwechsel' in German) was at first located in biology. Karl Marx introduced the term in his theories and proposed a social metabolism. See: Pfister, Christian: "Vom 'Hölzernen Zeitalter' zur Überflusgesellschaft. Veränderungen des gesellschaftlichen Stoffwechsels in Westeuropa im Verlaufe der letzten 300 Jahre – ein Überblick" in: *Ferum* 85/2013, p. 27-34.

02 For the prime material wood and the theories of Gottfried Semper on metabolism see the research project and publication: [gta.arch.ethz.ch/forschungsprojekte/stoffwechsel-die-dargestellte-wirklichkeit-der-architektur](http://gta.arch.ethz.ch/forschungsprojekte/stoffwechsel-die-dargestellte-wirklichkeit-der-architektur). (accessed on 10.18.2023)

03 See, for example: Ingold, Tim: "Eine Ökologie der Materialien", in: Witzgall, Susanne/Stakemeier, Kerstin (publ.): "Macht des Materials/Politik der Materialität", Zurich 2015, p. 65-73.

04 Material-Archiv is an association consisting of eleven sample-collections located at cultural and educational institutions. The members attend to the digital encyclopaedia materialarchiv.ch and create exhibitions and events on materials applied in design and the arts, in restorations and architecture.

The tactile experience of the material in combination with broadly researched backgrounds encourages further multi-perspective engagement with the materials. The main aim is to reflect on the use and access to materials in one's own creative project.

The assumption that there are inherently sustainable materials is widespread in the context of design and the arts, and for several years it has dominated inquiries about the ZHdK collection. The targeted and in-depth teaching of materials with hybrid names such as bio-plastic or vegan leather, so-called fake fur made from "natural" plant fibres or artificially produced but compostable filaments for products such as sneakers is therefore one of the most urgent requirements for the teaching and learning collection. The following considerations are intended to show some of the contexts for the analysis and assessment of individual materials in design.

### Limits of Growth



Sustainability is always linked to actions; it arises from the handling of raw materials and materials. Genuinely intertwined with human economics, the ancient idea was not regarded as a distinct concept for thousands of years because it was so self-evident.<sup>05</sup> Although environmental pollution has taken place since the first advanced civilisations, overgrazing, overfishing and rapid deforestation always had to be avoided.<sup>06</sup> Sustainability only becomes conceptualised in times of excessive use of certain resources: the word became established in the technical language of forestry in the 18th century when sustainable forestry was called for in Germany due to wide-ranging clear cutting of trees. The *Sylvicultura oeconomica*, published in 1713, was committed to "careful use of wood" and defined sustainability as an economic principle that ensures that wood can still be cut or that grain could be harvested tomorrow. Sustainable management is therefore geared towards yield and the best possible use of natural materials, especially renewable ones.<sup>07</sup>

The first global eco-movement of the 1970s and 80s had already criticised that former sustainable economies had become unbalanced by industrial manufacturing, including mass production and mobility. Although an anguished call for attention to "The Limits of Growth" went up at the time, pointing to finite material resources and dependence on intact ecosystems, the term sustainability was not yet used.<sup>08</sup> An

05 See: Grober, Ullrich: "Die Entdeckung der Nachhaltigkeit. Kulturgeschichte eines Begriffs", Munich 2013.

06 See: Kehnel, Annette: "Wir konnten auch anders. Eine kurze Geschichte der Nachhaltigkeit", Munich 2021.

07 Ib. p. 65.

08 Meadows, Donella & Meadows, Dennis (et al): "Die Grenzen des Wachstums. Bericht des Club of Rom", Hamburg 1973.

attitude critical of the economy and consumption, at least at the beginning of the movement, led to a rethinking of certain consumer ideas that had previously been euphorically celebrated as progress. These critical concepts still linger on in some social niches today and are currently being used for design attitudes in the sense of a critical handling of materials. Translated into English as “sustainability”, these ideas have only been conceptually popular since the 2000s and have now turned into a “normative fiction” but also into a consumer good itself.<sup>09</sup>

The “sustainable material” gets in the way of reflecting on the systems, practices and uses of materials because it is now used symbolically to create a marketable sustainability aesthetic. So-called organic and natural materials in particular are obviously suitable for keeping a *Zeitgeist* enraged by micro-plastics and fast fashion attuned to consumption nonetheless.

### Let's turn things around



**ILL-2** Both the idea of rethinking and that of a sustainable material cycle are now being spread by the marketing of large producers. “Let's turn things around” is the motto employed by the BMW Group in 2022 to demonstrate an interest in sustainable production in a large-format newspaper advertisement without using the term or a product name in an obtrusive way. The green advertising strategy is based on a leather substitute from the Mexican start-up Adriano di Marti S.A. de C.V., with which the BMW Holding collaborates. Desertt<sup>TM</sup> is a synthetic leather made from powdered cactus fibres and a bio-based polyurethane.<sup>10</sup>

The car manufacturer spells out their goals in the small print: “On the path to greater sustainability, we want to increasingly use renewable raw materials to produce vehicle parts. For example, we are researching seat covers with our partners that are partly made from pulverised cactus fibres.”<sup>11</sup>

The ad visualises the result of the research as the background, a close-up photograph of a cactus, the raw material for the filler in the artificial leather. However, the non-biodegradable plastic binder and the lack of recyclability of the composite material, the transport routes and the manufacturing effort merit no mention.

09 See: Gekeler, Moritz: “Konsumgut Nachhaltigkeit. Zur Inszenierung neuer Leitmotive in der Produktkommunikation”, Bielefeld 2012.


10 See: <https://www.bmwgroup.com/de/news/allgemein/2022/vegan-interior.html>. As a raw material, these hardy plants do not require much irrigation, can be harvested on a regular basis (once or twice a year) and leave behind fertile soil that then can be used for other crops.

11 DIE ZEIT, edition nr. 45, November 3, 2022, p. 38.



Contrary to the conventionality of the material, which is advertised as innovative, the spines of the cactus indicate resistance and stubbornness – against its use as a material? Should the material itself be suggested as the thorn in the side of an entrenched system? Doesn't this ad rather serve to emotionalise consumption, which is facilitated by making a "correct" decision for "sustainable materials" in the automotive industry, even in times of climate change?

Regardless of the misuse in the present example, it is worth taking a closer look at the terms "Reuse, Rethink and Reduce", which are arranged in a circle here: These so-called R-strategies should then be subjected to a short, fruitful analysis of the object-material-human relationship for design. Because they all relate to the use of things and the handling of the materials that make them up. But they are formed and supported by different concepts.

Waste prevention strategies have been proposed by waste disposal companies for several years and have been supplemented and adapted in the course of these debates. As verbs, i.e. as "do words", they refer to the actions through which statically visualised circulatory images, such as the butterfly model based on the Cradle to Cradle® approaches , are meant to be set in motion.<sup>12</sup>

What they have in common is the prefix re-, which in its Latin origin has two meanings, a Janus-headedness that is evident in German in the equivalent of the word "wi(e)der". The meaning of "back" and "against", which is expressed in the words "Widerstand" (resistance) or "Revolution", at first glance contradicts the meaning of "returning" and "again". If the latter is in harmony with the image of the circle, in which everything always recurs, resisting seems to interrupt, then reverse it and thus seems to run contrary to the circle.

The R-strategies are related to a circular economy, which, in view of the devastating waste problem worldwide, has to be without an alternative, regardless of the pitfalls and potholes that such a model brings with it. It seems to me that we need to understand these buzzwords as they are anchored in the reality of action according to their different relationships to goods and products, and thus discuss sustainable activities. This makes more sense to me than demanding objects created from a new, "sustainable" materiality. If the R-strategies are taken seriously, they are a call to citizens, but also to companies and enterprises, to take a step backwards instead of moving forward. This serves the goal to interrupt the linear and binary understanding ranging from natural substances to plastics to waste and worthless or even

12 An overview on R-strategies as part of concepts for a "Circular Economy" are available here: [www.prospekollleg.de/r-strategien/](http://www.prospekollleg.de/r-strategien/) (accessed 10.18.2023) and Ellen MacArthur Foundation (publ.): "Towards the circular economy Vol.1: An economic and business rationale for an accelerated transition", 2013, p. 7.



destructive products such as CO<sub>2</sub>. By pausing and engaging with the materiality of things, a system that produces waste could be changed.

### Rethink, Reuse, Repair



Some of the R-strategies take into account the inherent dynamics of materials and negotiate aging aesthetically, while others exclude this and therefore quickly fail. The different ways of dealing with objects should in no way be played off against each other; Their coexistence must be a natural element of sensible use of materials.<sup>13</sup> The following is a brief overview of their differentiations for design and artistic creation:

According to the *Re-Fuse* strategy, there would actually be no need for product design anymore because nothing new would have to be designed. A *Re-Think* would mean that everything is designed differently than it was ever designed. This approach risks to jeopardise cycles and processes that are currently running well. The *Re-Use* strategy requires using items again, and as often as possible. Objects should therefore be designed that are intended to be used in reusable systems, for example, that last longer or that are ‚timeless design‘. One goal here would be to create classics. Phenomena such as vintage show what enormous potential lies in the distinctive function of objects associated with connoisseurship.

With *Re-Purpose*, reuse is given a different function. As a design approach, the misuse of an object requires an engagement with the given, which on the one hand limits one's own actions as a designer, but brings design into negotiation with the temporality of material artefacts through a formal and material setting.

Repairing, *Re-Pair*, as a term has an even more far-reaching meaning than reusing, because energy, materials and, above all, time are invested for a continued use of an object. An objective therefore is not designed for "disposal" from the outset, but on the contrary design aims to imbue items with a value that protects them from the landfill. By dealing with the object while restoring its function, a relationship with the materiality and the value of objects is established, according to a romantic, culturally historical but confirmed idea.<sup>14</sup>

Repairing therefore has many facets: in buildings it is called renovating. Restoring seeks to achieve an original condition and shares a respect for traces and aging in common with vintage. In pre-industrial mend-

13 Krebs, Stefan/Schabacher, Gabriele, Weber, Heike: "Kulturen des Reparierens: Dinge - Wissen - Praktiken", Transkript Verlag, 2018.

14 See: Böhme, Hartmut: "Fetischismus und Kultur. Eine andere Theorie der Moderne", Reinbek 2006.

ing, repairs were made by hand and usually heavily modified because standardised materials were not yet available. When literally repairing, however, you replace broken elements with new ones. The principle is tied to the serial production of individual parts that, when assembled, form an object. For design, this means creating items whose individual parts can be easily replaced. What should not be forgotten, however, is the contradictory potential that lies in the concept of ease of repairing and the implementation of sensible exchange systems: It is a critique of consumerism not to want to buy new things, but rather to build a relationship with the items you are using throughout your life.

### Recycle & reduce



**ILL-4** *Re-Cycling*, on the other hand, destroys the object; it is broken down into individual materials that can now become other items. This strategy perceives materials not only as valuable, but also as “nutrients” that are used in biological or technical cycles.<sup>15</sup> And this closes the circle of this text by taking us back to its beginning, to material metabolism. In addition to upcycling, the material variant of the repurposing described above, recycling is the only one of the R-strategies that literally and actually aims to use materials endlessly (at least in theory).<sup>16</sup>

The seemingly simplest, but obviously most difficult of the instructions for making material use more sustainable, takes the stage as the final strategy in my remarks: *Re-Duce*. Simpler designs using less materials, resulting in fewer emissions and fewer by-products and waste products in production, processing and transport. And of course less marketing, fewer collections, lower quantities.

So instead of classifying them as better or worse, materials should be used more intelligently to shape our living environment. To this end, it is worthwhile to include the material as a creative counterpart in the design process and to make its suitability and inclinations fruitful for both design and use.<sup>17</sup> Adopting a relationship with the material, as happens when we engage in mending, repairing and restoring things, may also help to avoid energy-intensive removal of it from its areas of origin and thus avoid the usually horrifying ecological and social side effects. If materials rust, turn grey, yellow, become brittle, warp or change in unknown ways, they do not have to be given up, but only need to be disposed of as waste materials at some point.

15 See: Braungart, Michael & McDonough, William (2016): a “Cradle to Cradle. Einfach intelligent produzieren.” Complete paperback, 4th edition. Munich, Berlin, Zurich: Piper.

16 On the relationships between dissipation running counter to cycles and the “qualities” and “tendencies” of materials see: Soentgen, Jens: “Die `Mobilmachung der Materie´. Stoffströme und Stoffkreisläufe aus Sicht der stoffgeschichtlichen Forschung”, Zeitschrift für Medienwissenschaft, vol. 12, no. 23-2, 2020, p. 32-40.

17 See: Soentgen, p.33.

So if design and the arts stimulate a metabolism and engage in the complex interweaving of matter and form in order to make ecologically sensible and clever design interventions, then they would do well not to just rely on substitute materials. Instead of thinking of new wine into old skins, the skins could also be replaced. Like everything in the world, every material has advantages and disadvantages, qualities we value, and cursed tendencies. But it is up to us to act, sustainably or not. And we could certainly do something more interesting with the wine – and its yeast creatures – than keep it in bottles.

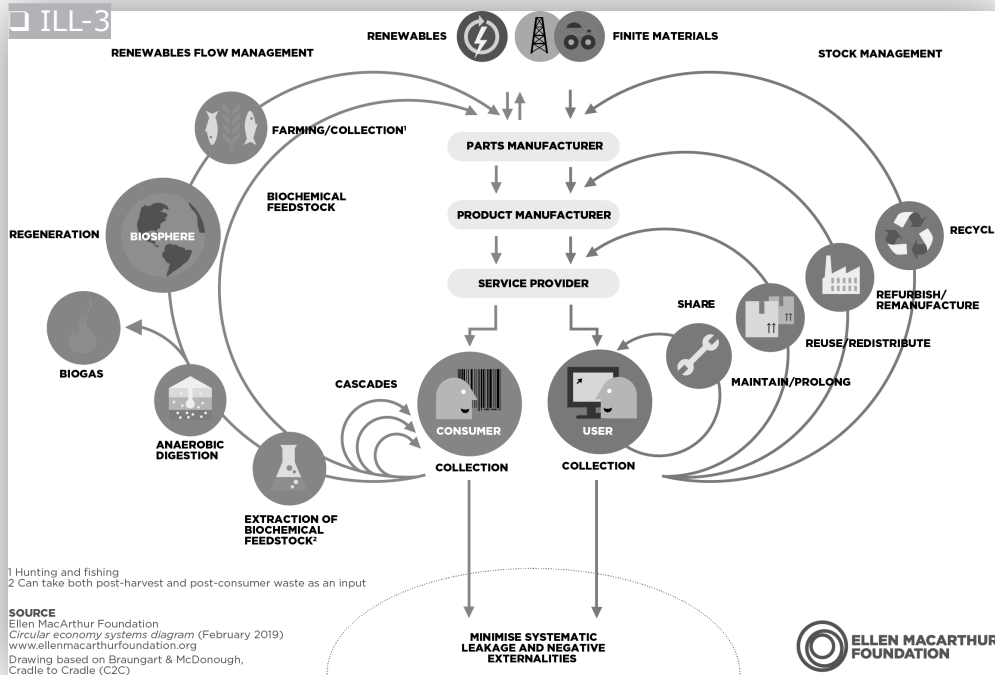


ILL-2



Insight into the material collection of the Zurich University of the Arts

BMW Ad in DIE ZEIT



a thing becomes material again





## Image Credits



ILL-1

Einblick in die Materialsammlung der Zürcher Hochschule der Künste ZHdK, MIZ Medien- und Informationszentrum  
Foto: Betty Fleck, ZHdK

ILL-2

Zeitungsanzeige der BMW Group in DIE ZEIT, 2022

ILL-3

Sog. Butterfly-Modell, publiziert von der Ellen McArthur Stiftung, 2019

ILL-4

Ein Ding wird wieder Material: Foto: © Filter Collective,  
Lizenz: Creative Commons BY-ND 2.0, Quelle: Flickr.com

Every effort has been made to seek permission to reproduce those images whose copyright does not reside with the editors and authors, and we are grateful to the individuals and institutions who have assisted in this task. Any omissions are entirely unintentional, and the details should be addressed to the editors.