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HOCHSCHULE DARMSTADT UNIVERSITY OF APPLIES SCIENCES

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

Handbook of Leather Design for Sustainable Development

Subproject 4 | Dr. Jonas Rehn-Groenendijk | Department of Design



für Bildung und Forschung





Content

Project Description

Results

- Outlook: What's next?

Dr. Jonas Rehn-Groenendijk

Implementation project 8 System innovation for sustainable development s:ne Darmstadt University of Applied Sciences

> Final conference 16.11.2022

Field Test: Competition & Mentoring Program

Objective(s) of the subproject





Implementation project 8 System innovation for sustainable development s:ne Darmstadt University of Applied Sciences

> Final conference 16.11.2022



2. Applying the Guidelines in a Pilot Study

... colaboration of industry & academia.

Development of Guidelines Co-Creation by Industry, NGOs and Academia!

... to support development of more sustainable leather products.



Transdisciplinary Approach

Project Group / Co-Authors / Reviewers

h_da

Academia







TRACEABLE LEATHER









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Research Questions of the Guidelines



Dr. Jonas Rehn-Groenendijk

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What aspects need to be considered in order to design more sustainable leather products?

What are the relevant **design principles** that promote aspects of sustainable development for leather products?

Are there **specific properties** of (more sustainable) leather that should be addressed by design (e.g. durability, etc.)?

Which **business models** can be developed from this (e.g. product service systems)?



attitudes towards leather in general and the issue o.

Results Leather Survey 2020 Factsheet: Citizens' Panel "Survey on Leather Goods and Consumer Behaviour"

ducted via an shapping of sustainable development. All surveys are conducted via an on online-tool and a participant database. Participants are recruited onune-toot and a participant database. Farticipants are recruited through random sampling from local citizen registries as well as shaping of sustainable developm



leather in particula

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[n=577]

Perception of leather & leatherette



Results Leather Survey 2020 Factsheet: Citizens' Panel "Survey on Leather Goods and Consumer Behaviour"

Gender

-tool and a participant database. Participants are recruited npling from local citizen registries as we

Period:

Innovative Water Comment



attitudes towards leather in par





Dr. Jonas Rehn-Groenendijk

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Project plan

Preparatory Work / Interviews

University Team (h_da)

Transdisciplinary Team

Dr. Jonas Rehn-Groenendijk

Implementation project 8 System innovation for sustainable development s:ne Darmstadt University of Applied Sciences



Project plan

Preparatory Work / Interviews

Workshop #1 | 05.10.2020

University Team (h_da)

Transdisciplinary Team

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Handbook of Leather Design for Sustainable Development

Asystemic transdisciplinary approach

Edited by Jonas Rehn-Groenendijk, Karen Lehmann & Julian Schenten

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SYSTEMINNOVATION FÜR NACHHALTIGE ENTWICKLUM

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Global leather supply chains differ by product category and actual product. Since roughly half of the global leather production is used for leather shoes, a typical global supply chain for shoe production is used as an example of the different supply chains for the purpose of illustration.

From Hides to Wets

The use of leather as a material requires a relatively large amount of skilled manual labour in production. A shoe made of woven materials can be produced mainly by a machine; the remaining manual assembly can be completed by unskilled labour. The production of a leather shoe cannot be automated to that degree and requires a more extensive skill set.

The actual process of making leather out of hides is a complex one that includes many different steps with a number of chemicals and mechanical processes (see fig. 3.2.3). Before the tanning process can take place, hides are soaked, the skin is disintegrated in the limer to remove hair and loosen the skin fibre structure. After the mechanical removal of the subcutaneous connective tissue (unfleshing) and sometimes splitting (if the skin is too thick), deliming and enzymatic pickling take place. For skin types with a lot of natural fat (such as pig or sheep), additional degreasing and, for some tanning types, additional pickling is done.



Fig. 3.2.3) Simplified illustration of tanning process (for a larger version of the illustration see p. 216-217)

After this first phase, the hides are ready for the actual tanning process, which can be done with the use of various tanning agents (e.g. chromium, glutardialdehydes, fatty tannins from fish, vegetable tanning agents or

other newly developed tanning agents). Once this tanning phase is finished, neutralisation, drain (withering) and thickness regulation are carried out. Depending on the tanning agent used, the result is what is called in the industry wet blue (from chromium tanned leather), veg tan green or wet white.



Fig. 3.2.4) Hides after vegetable tanning process (photo: Nina Conrad, bttr GmbH)

Since these wets are commodities, usually at this point the raw material changes ownership sometimes across countries or continents.

After this, stretching, draining, drying and moistening (conditioning) takes place before the material is softened by mechanical processing (cleats and mills) and dried. Finally, during dry finishing, the surface is being treated by, for instance, burnishing, polishing, oiling, lacquering or the application of a coating layer from polyurethane (see also chapter 2.3).

From Wets to Leather

From there on, the wets undergo wet finishing, including bleaching, retanning, dyeing and greasing. Here, sometimes colorants are used to change the colour of the future leather according to the desired design.

Fig. 3.2.5) Streching and drying of wet blue (photo: Südleder & Ecopell)

This last step of dry finishing is sometimes performed by specialised companies. The finished leather is then usually sold via global leather dealers.

From Leather to Shoe

According to APICCAPS (Statista 2022) 3,2% of the global shoe production is allocated in Europe . With regards to leather shoes in particular, according to FAO (2016) 4.565 mio pairs of leather shoes had been produced globally in 2014. While most of these shoes were produced in Asia (2.759 mio pairs), 17,7 % of the global share (807 mio pairs) were produced in Europe. The most important european region in this regard is from Italy (302 mio pairs) followed by Spain

Cuir bouilli and wet moulding



Fig. 3.7.3) 'Fendi mannequin', made with cuir bouilli technique, Simon Hassan, UK, 2013. Courtesy of Simon Hasan.

A very interesting application of leather is known by the name cuir bouilli. Cuir bouilli is an old Norman term for a technique that processes wet leather using a mould. It was used for the manufacture of drinking vessels, bottles, boots, helmets, cuirasses and shields, among other things. Cuir bouilli literally means 'cooked leather'. For centuries that term has caused a lot of confusion as leather loses its firmness completely when heated to around 75-90 C° and after drying it becomes dry and brittle. [2] So in fact the leather is not boiled, but heated in hot water until the shrinkage temperature of the leather is reached. This limits the leather's loss of elasticity and creates a stiff, strong material that can be used to manufacture both water resistant and protective objects like containers and buckets. To maintain its shape, the leather still needs to be finished. A disadvantage of cuir bouilli is that it eventually may dry out and become brittle. A technique that leads to a more stable result is known as wetformed leather. The leather is soaked in water for a few days and then pulled over a mould and dried. Optionally, separately manufactured parts are sewn together, as is the case with miners' helmets. Wet-moulded or formed leather is very strong and stable.

It is not unimportant to mention that this technique can only be applied on vegetable tanned leather. Vegetable tanned leather, due to its tanning method, is less waterproof than Chrome-tanned leather and is prone to uptake water more easily. Contemporary examples of cuir bouilli can be found in designs by Simon Hasan, Sanna Svedestedt and Christoph Lemaire, but also in the haute couture collections of Alexander McQueen, Schiaparelli and Marina Hoermanseder. The Shoe Museum will be hosting an exhibition on this extraordinary material by the name 'The magic of cuir bouilli' in Spring/Summer 2023.



Fig. 3.7.4) Sixteenth century shoe made into a mule. Collection Schoenenkwartier, Invnr. 12088

> Wet moulding is reflected in the traditional footwear of the Balkan peoples, the opanci. The sole of this shoe type is wet-moulded around the bottom of a shoe last, creating a waterproof sole with raised edges. The upper is then braided from strips of leather. Dutch shoe designer Amber Ambrose Aurèle

Gilt leather

has created a small collection of high heeled shoes inspired by Serbian opanci, using the raised edges as a specific feature of her designs.



Fig. 3.7.5) Rex Lingwood, Bowl, 1990s, cuir bouilli technique, collection Schoenenkwartier Invnr. 85065.

Another product in which moisture and temperature played a major role during production was gilt leather. Gilt leather was used as a wall covering and replaced the woven tapestries that had insulated the walls of palaces and castles for centuries. Gilt leather was produced in Ghadames, Libya, as early as the ninth century. Via the Umayyad conquest of Hispania, the technique also reached the Iberian peninsula from where it spread to Italy and northern European countries such as the Netherlands and England. Manufacturing gilt leather was a very time-consuming and specialist-type of work that also required a great deal of material knowledge.

Gilt leather was made by covering wooden frames with bovine leather. After stretching, the leather was covered with silver leaf. This could only be done in dry weather, as silver corrodes immediately and turns black in a damp environment. Subsequently, the silver leaf was covered with a yellow varnish, creating a golden shine, after which gilt leather is named. Once the vanish had

need to do intensive research before considering buying a shoe from a certain brand, they may decide on those brands that offer the needed information. For example, some brands such as Meindle already offer (QR) codes with their products allowing consumers to find more detailed information about materials and origins. Another way to decide on a product with limited information is to trust in labels, where available. Labels are in many cases the only information consumers get on the sustainable performance of a product. Although it is very hard to know all relevant labels and the criteria to be met, many people trust in products of brands with concise messaging on climate impact and third-party certification (UK Leather, 2021).

1.4 Willingness to pay

Studies have found environmentally aware consumers to have generally a higher willingness to pay for products that are produced in environmentally less harmful ways (Tey, Brindal, & Dibba, 2018; Ha-Brookshire & Norum, 2011). Assuming that the leather industry would be less hesitant to invest in manufacturing of leather products that are less harmful to environment and tracing systems for chemicals if this investment could be compensated for by retail prices, Eisen et al. investigated consumers' willingness to pay. They found that consumers are willing to pay more for leather products that have been manufactured in a way that is less harmful to environment and health and an additional premium if information concerning the supply chain is provided. These findings indicate that some of the extra costs that may accrue for measures to promote sustainable development can be forwarded to consumers, if plausible and well-communicated.



Fig. 3.8.1) Adapted illustration of the results of the investigations by Eisen et al. (under review; 2022)

1.5 Irrationality of purchasing behaviour

In line with current research findings in the field of consumer psychology (e.g. Dijksterhuis et al., 2005), neuro-marketing, and behavioural economics (Ariely,

2010), purchasing behaviour is complex and in many cases based on situational and often subconscious aspects. Price, status, and seasonal trends affect this in the same way as association with specific memories, peers, and symbolic values (e.g. Lindström, 2010, 2011). An important aspect of purchasing and using leather products is the meaning and signs these products represent. Products can be seen as signifiers to enable consumers to be part of a group (e.g. Harley Davidson or Apple) and indicate shared values or beliefs. Designing products and business models with this in mind can create a strong emotional bond and strengthen the willingness to maintain and keep products rather than disposing of them to buy the latest seasonal fashion.

Design teams that aim at creating products that foster sustainable development are advised to not only consider the factual and rational impulse of consumers when making purchase decisions. In coordination with marketing and communication efforts (see also chapter 4.5), design decisions must be based on comprehensive strategies that follow specific principles and aim at certain effects. This can serve to raise awareness of environmental and health concerns associated with conventional products. Examples of this can be found in the field of organic food, which in many cases is advertised and presented as the healthier and more environmentally friendlier choice. However, marketing and design strategies can also focus on aspects of sustainable development as a self-evident mindset following the overall DNA of a brand. Several children's toy brands follow this principle. Instead of primarily communicating their sustainability efforts, it is part of their image of being fair, future-oriented, and social.

Furthermore, as many purchasing decisions are largely determined by product prices, innovative and sustainable business models could be a tool to target a new audience by using, for instance, leasing models (use-oriented product-service-systems). Instead of buying an expensive shoe at a high price, consumers can choose to wear this shoe for a certain period at a significantly lower price. In this case, a circular business model is not the actual reason for the purchase, but the need for a lower price, which in turn triggers the impulse to buy.

Using and Maintenance

Apart from the actual purchase behaviour, consumer behaviour also refers to how consumers interact with these products, how long they are willing to use them, how well they treat and maintain these products and whether or not they will reuse leather products (see also Ceschin & Gaziulusoy, 2016).

In contrast to many other materials (such as polyurethane), if applied properly, leather is very robust, repairable, and can last for decades. This allows leather products to have an extended lifetime and to be reused by other consumers. This potential of leather is further supported by its cultural and emotional value (see e.g. chapter 3.7), which is usually associated with luxurious and durable materials. However, recent research shows that only a few people repair their broken leather products or bring them to a repair service (Leather UK, 2021).

Handbook of Leather Design for Sustainable Development

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Leather Product Design Canvas

Business Model Canvas (based on Osterwalder et al., 2013)

The Business Model Canvas

Key Partners

Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform? MOTIVATIONS FOR FUNCTIONS Particular decomony Reduction of risk and uncertainty Acquisition of particular resources and activities Key Activities

What Key Activities do our Value Propositions require Our Distribution Channels? Customer Relationships? Revenue streams?



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Cost Structure

What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive? so the UNINERSE MOLE Cost Driven (Ground and a creation, premium value proposition, maximum automation, extensive outsourcit Value Driven (Ground on value creation, premium value proposition) SMMPL CHARGENETSE: Fixed Costs (plantice, ronts, utilities) Variable costs Economies of scale Economies of scale

www.businessmodelgeneration.com



Osterwalder, Alexander; Pigneur, Yves (2013): Business model generation. A handbook for visionaries, game changers, and challengers. New York: Wiley&Sons.



Layout of Leather Product Design Canvas



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Leather Product Design Canvas (Rehn, 2021)

Leather Product Design Canvas for Sustainable Development

Material Knowledge

What are all the relevant material options? Can you ensure sustained supply of these materials?

Appropriateness of Material Choice

- What functional or aesthetic properties of the leather are used in your product?
- How does the material choice relate to the overall design? Can leather replace another (less sustainable) material? Can another (more sustainable) material replace leather?

Type of Leather

Is the type of leather used (tanning process, animal origin, etc.) appropriate for the products functionality and aesthetics?

Chemicals & Finishing

Did the chemical managament during the production ensure a high level of protection of human health snd the environment? Does your finishing require specific (and potentially harmful) chemicals? Is the finishing appropriate to the anticipated usage (e.g. does it lead to a higher usage of chemical protection or caring products?)?

Materials

Legal aspects and business potentials

What are the relevant regulatory frameworks (e.g. EU Green Deal, REACH supply chain due diligence in terms of social and environmental aspects, ...]? What are working and environmental standards at the locations your are sourcing from? Can you find business opportunities derived

from these regulatory impulses?

Process Optimisation & Waste Avoidance [Pre-Consumer Aspects]

Does producing your product create unnecessary waste (e.g. from splitting, cutting, etc.)?

Could you adapt the design in a way that producing your product require less harmful chemicals?

use-phase?

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Jonas Rehn, Darmstadt University of Applied Sciences | jonas.rehn@h-da.de | Release: October 2021 For more information visit: https://sne.h-da.de/leather-chemistry. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

21



Application Example

Designed by: Iteration no. Leather Product Design Canvas for Sustainable Development Date: Project: Material Knowledge Appropriateness **Business Model** Marketing & Communications of Material Choice What are all the relevant material options? How can you make your business model (more) circular? How do you communicate so that consumers value how your product fosters Can you ensure sustained supply of these materials? sustainable development? What functional or aesthetic properties of the leather are -> Do resend on new type of leather! How and how much information on chemicals, working conditions etc. do you used in your product? share with your consumers? N · be bust - s it is ust perfect but transport. Co Discus diday with bandha! How does the material choice relate to the overall design? Can leather replace another (less sustainable) material? Can another (more sustainable) material replace leather? Who is your Consumer? Sourcing What do you know about your target group regarding the usage and What is the geographic origin of the hide? disposal of leather products? From where does the leather come from (company / country)? What are their values, believes and behavioural patterns? What are socio-economic consequences from sourcing (and not Chemicals & Finishing Material Diversity Type of Leather What do they know about sustainable development with regards to this sourcing) the leather from this origin? Can you establish trustful and sustained cooperations with product We used more repearch How can you reduce the total number of Is the type of leather used (tanning process, Did the chemical managament during the manufacturers? It is easing to trace, it is have loss production ensure a high level of protection materials used for your product? animal origin, etc.) JEX of LIK steps in the motor. of human health snd the environment? appropriate for the products functionality Do us have to reduce the and aesthetics? Does your finishing require specific (and potentially harmful) chemicals? natorials? - D fleeting with Philip us of Is the finishing appropriate to the anticipated usage (e.g. does it lead to a higher **Consumer Behaviour Change** Traceability () We week a tool ? - Marking and Kardy heles by devicals ? 6 Idea: usage of chemical protection or caring Offer a nonte of products?]? How can your design foster more sustainable consumption patterns What can you trace regarding the origin of the leather and the supportantle underide chemicals used? out rel regarding your product (e.g. maintenance, sharing, repairing, etc.)? 10-conting Can your design / marketing strategy increase awareness regarding How can you be sure the information you are receiving is valid? Lo Ve chage the norration! sustainability issues in the context of leather products? dissue from To what extent can you trace back chemicals used in during the Netwel production of the leather? these change our there Modula PRE-CONSUMER ASPECTS POST-CONSUMER ASPECTS Legal aspects and Reparability Product Ecosystem Product Lifespan **Process Optimisation** Recyclability business potentials How can you increase reparability of your product? & Waste Avoidance & Circular Economy How do you extend the product life? What is the ecosystem around your Can you help your consumer to repair (e.g. with ser-How do you ensure a specific quality product? Can you add or adjust additio-What are the relevant regulatory framevices or additional products How do we day. nal products or services to make your works (e.g. EU Green Deal, REACH supply Does producing your product create unne-What happens with your product after its to the loop! product more cessary waste (e.g. from splitting, cutting, chain due diligence in terms of social and use-phase? sustainable? environmental aspects, ...]? etc.)? Can it be easily dissassembled? Could you adapt the design in a way that Are there collection points and other What are working and environmental infrastructure that facilitate recycling? standards at the locations your are sourcing producing your product require less harmful Maintenan Can you use (or avoid) specific added from? chemicals? Can you find business opportunities derived materials, chemicals or processes to lavorts = relund from these regulatory impulses? ensure or increase recyclability? Longevity What do we need to convi Unote as we should when airising for fell under How can you extent the product's lifetime? What are the specific technical and conceptual features that make your product more durable? How aesthetics and emotionals aspects of the design make consumers use your product for a longer period of time?

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> **Final conference** 16.11.2022



Jonas Rehn, Darmstadt University of Applied Sciences | jonas.rehn@h-da.de | Release: October 2021 his Leather Product Design Canvas is a result of the project "More sustainable leather chemistry" as part of the transformative research project "System innovation for sustainable development" at Darmstadt University of Applied Sciences. his work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.



Repair



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Marketing & Communications How do you communicate so that consumers value how your product fosters sustainable development? How and how much information on chemicals, working conditions etc. do you share with your consumers?

Sourcing From where does the leather come from [company / country]?

manufacturers?

Traceability

What can you trace regarding the origin of the leather and the chemicals used ? How can you be sure the information you are receiving is valid? Now can you be sure the information you are receiving is value? To what extent can you trace back chemicals used in during the production of the leather?

What are socio-economic consequences from sourcing (and not

Sourcing) the warner from this origin? Can you establish trustful and sustained cooperations with

Reparability

mak

How

How can you increase reparability of your product? Can you help your consumer to repair (e.g. with services or additional products)?

Longevity How can you extent the product's lifetime? What are schnical and conceptual features that

Product Ecosystem What is the ecosystem around your product? Can you add or adjust additional products or services to make your

product more sustainable?

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Content

Project Description

Results

Outlook: What's next?

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Field Test: Competition & Mentoring Program

MORE SUSTAINABLE LEATHER PRODUCTS

Design Competition & Mentoring Program

International Jury & Mentor Panel from Industry and Academia
Exclusive Mentoring Phase for Finalists
High Visibility Across Disciplines and Boarders



Bundesministerium für Bildung und Forschung



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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT





SCIENCES

MORE SUSTAINABLE 2022 LEATHER PRODUCTS

Design Competition & Mentoring Program

JURY MEMBERS & MENTORS

among others...

HOSTS OF THE COMPETITION

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Senior Design Researcher at Darmstadt University of Applied Sciences. Head of project "Design Guidelines for More Sustainable Leather Products"



Karl Borgschulze

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

Design and leather goods expert and International Relation Manager for COSMO Foundation, the head organization of Accademia Della Moda, ITS COSMO and ACOF.



Dr. Gerhard Nickolaus Former director of PFI Hong Kong Ltd. and PFI Fareast Ltd., he founded the International Shoe Competence Center in Pirmasens (ISC) and Asia



Dr. Julian Schenten

Researcher at Darmstadt University of Applied Sciences & Head of project "More Sustainable Chemistry in the Leather Supply Chains"



Dr. Charis Stoica Researcher at Darmstadt University of Applied Sciences



Seven Reimers Quality Management | Corporate Social Responsibility LLOYD Shoes GmbH



Researcher at Darmstadt University of Applied Sciences

Assistant professor of the Leather Product Design and Technology department at Polytechnic ATK Yogyakarta

DESIGN COMPETITION Phases











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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

Phase 3 **Final Submission**

Elaborated design concepts based on Handbook of Leather Design







DESIGN COMPETITION 8 Teams /// 14 Participants /// 4 Countries















Innovative Hochschule







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SUSTAINABLE LEATHER PRDUCT AWARD and the winner ist...



SUSTAINABLE LEATHER PRODUCT AWARD









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Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Bronze 2022" to

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022"

Darmstadt, 16th of November 2022

Jonas Rehn-Groenendijk tadt University of Applied Sciences Host of the Design Competition

Dr. Julian Schenten Darmstadt University of Applied Sciences Head of project ... More Sustainable Chemistry in the Leather Supply Chains"

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

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This certificate is aquired in the context of the transformative research project "sne (system in novation for sustainable development)" and subproject "More Sustainable Leather Chemistry" at Darmstadt University of Applied Sciences and is awarded by the undersigning experts of the project.



Gemeinsame Wissenschaftskonferenz für Bildung und Forschung

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Design Competition & Mentoring Program

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Darmstadt, 16th of November 2022

Chan ha Dr. Julian Schenten

Darmstadt University of Applied Sciences Head of project ... More Sustainable Chemistry in the Leather Supply Chains

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HOCHSCHULE DARMSTADT UNIVERSITY OF APPLIED SCIENCES

SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT



Jonas Rehn-Groenendijl

Host of the Design Competition

adt University of Applied Sciences

This certificate is aquired in the context of the transformative research project "sne (system innovation for sustainable development)" and subproject "More Sustainable Leather Chemistry" at Darmstadt University of Applied Sciences and is awarded by the undersigning experts of the project.



für Bildung und Forschung

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT



IIN KHARISMA from ATK Polytechnic Indonesia



Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Bronze 2022" to

lin Kharisma

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022"

Darmstadt, 16th of November 2022

Chan ton Dr. Julian Schenten

Darmstadt University of Applied Sciences Head of project "More Sustainable Chemistry in the Leather Supply Chains

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IIN KHARISMA from ATK Polytechnic Indonesia

Concept: JTAK Athletic Mount Sandals





Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Silver 2022" to

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022".

Darmstadt, 16th of November 2022

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

Dr. Julian Schenten Darmstadt University of Applied Sciences

Head of project "More Sustainable Chemistry in the Leather Supply Chains

Dr. Jonas Rehn-Groenendijk Darmstadt University of Applied Sciences Host of the Design Competition

Innovative Hochschule

Eine gemeinsame Initiative von Bund und Ländern

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MORE SUSTAINABLE 2022 LEATHER PRODUCTS

Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Silver 2022" to

Dinu Jackson

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022".

Darmstadt, 16th of November 2022

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT

Dr. Julian Schenten

Darmstadt University of Applied Sciences

Head of project "More Sustainable Chemistry in the Leather Supply Chain

Dr. Jonas Rehn-Groenendijk Darmstadt University of Applied Sciences Host of the Design Competition

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT



DINU JACKSON

Central Footwear Training Institute Chennai, India



Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

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Dinu Jackson

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022".

Darmstadt, 16th of November 2022

Dr. Julian Schenten

Darmstadt University of Applied Sciences

Head of project "More Sustainable Chemistry in the Leather Supply Chain

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Dr. Jonas Rehn-Groenendijk Darmstadt University of Applied Sciences Host of the Design Competition

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DINU JACKSON

Central Footwear Training Institute Chennai, India

Concept: WINSUM SHOE





Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Gold 2022" to

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022"

Darmstadt, 16th of November 2022

Jonas Rehn-Groenendiik

stadt University of Applied Sciences Host of the Design Competition

Dr. Julian Schenten Darmstadt University of Applied Sciences Head of project "More Sustainable Chemistry in the Leather Supply Chains"

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Design Competition & Mentoring Program

SUSTAINABLE LEATHER PRODUCT AWARD

We herewith confer the distinction "Sustainable Leather Product Award Gold 2022" to

Team Fusion

for submitting the best leather product concept in the final phase of the design competition "More Sustainable Leather Products 2022"

Darmstadt, 16th of November 2022

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Dr. Julian Schenten Darmstadt University of Applied Sciences Head of project "More Sustainable Chemistry in the Leather Supply Chains



lonas Rehn-Groenendi

Host of the Design Competition

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SYSTEM INNOVATION FOR SUSTAINABLE DEVELOPMENT



TEAM FUSION

from Khulna University of Engineering and Technology, Bangladesh

Sakina Islam Afsana Akther Mimi Farhin Tasnim Maisha Tasmia Nourin Pollen

Concept: Stylish Ladies' Bag



Semi chrome tanned leather- (Tanning-Chrome tanning & Retanning-Vegetable tanning) Proper tanning and less use of chromium will make the product less harmful & more sustainable

Leather splits, scraps generated during production and gained from recycling will be used as reinforcement to strengthen & for repairing the damaged products for recyclability

Sheep intestine catgut will be used for string, lace, & straps making for their strength and flexibility and for proper utilization of of animal byproducts. They will also be used as part of conveyer belt of the machines

Detachable cover

All the fasteners, fittings, and accessories will be of metals and magnets for proper reusability, durability and fashion appeal. Even if any of the part of these accessories gets broken that can be repaired, or exchanged













Semi chrome tanned leather- (Tanning-Chrome tanning & Retanning- Vegetable tanning) Proper tanning and less use of chromium will make the product less harmful & more sustainable



The submission...

- ... addresses many considerations elaborated in the handbook of leather design
- ... is based on a systemic perspective on sustainable development
- ... conveys a coherent, convincing and clever idea that is appropriate for the target group.
- ... applies existing elements in an innovative way.
- ... displays market opportunities, is easily scalable and feasible to produce.

Detachable cover

magnets for proper reusability, durability and fashion appeal. Even if any of the part of these accessories gets broken that can be repaired, or exchanged





Dr. Jonas Rehn-Groenendijk

Implementation project 8 System innovation for sustainable development s:ne Darmstadt University of Applied Sciences

> Final conference 16.11.2022

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What's next...?!





A systemic transdisciplinary approach

Dr. Jonas Rehn-Groenendijk

Implementation project 8 System innovation for sustainable development s:ne Darmstadt University of Applied Sciences

Final conference 16.11.2022

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Thank you for your attention.

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Teilvorhaben 8 Nachhaltigere Chemie in den Lederlieferketten Forschungsbasiertes Transferprojekt "Systeminnovation für Nachhaltige Entwicklung s:ne" Hochschule Darmstadt



try | jonas.rehn@h-da.de