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More Sustainable Leather Chemistry

IT Tools and Governance for Traceability of Chemicals in the Leather Supply Chains

Survey Outcomes

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This paper documents key findings of the survey „IT Tools and Governance for Traceability of Chemicals along the Leather Supply Chains" conducted within the multi-stakeholder project "More Sustainable Leather Chemistry in the Leather Supply Chains" under the transformative research program s:ne at the Darmstadt University of Applied Sciences (h_da).[1]

Since communication with industry and other stakeholders is essential for the project, the survey was a call to chemical suppliers, tanneries, brands, retailers, and all other actors in the global leather supply chains, as well as NGOs, consultants, and certifiers, to feed in their perspectives. The survey focused on a couple of subjects related to the governance of IT Tools for Traceability of Chemicals: the scope of chemicals reporting, and related exemptions, that IT tools for traceability should take into account.

"Traceability" in this context means the possibility to trace back which chemicals are present in which component of an article (or were also used in the process). Suppliers must provide information on this.

The answers help the project derive rules for a governance framework for the reporting of chemicals. It is important that the sector agrees on such basic rules, as standardisation will unlock high-quality data while ensuring reporting efficiency and thus reducing costs.

The open to all-survey was promoted from April to July 2021 via the project´s homepage and newsletter, the corresponding LinkedIn website, and in a speech given at the 2021 Filk, Freiberg Leather Days.

1. Background

Increasing societal demands as well as legal requirements regarding chemicals in products and their manufacturing processes are putting increasing pressure on all actors along the leather supply chains. At the same time, these developments are creating a window of opportunity for companies that engage in more sustainable chemistry. More information on current political and legal developments can be

[1] Funding acknowledgments The Darmstadt University of Applied Sciences (h_da) started in 2018 the project s:ne - system innovation for sustainable development. The Federal Ministry of Education and Research (BMBF) and the State of Hesse support h_da as part of the federal-state initiative "Innovative Hochschule" (Innovative University). One implementation-project deals with "More Sustainable Chemistry in the Leather Supply Chains."

Innovative Hochschule
EINE GEMEINSAME INITIATIVE VON
Bundesministerium für Bildung und Forschung
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found in the Handbook of Leather Design for Sustainable Development.[2]

To mitigate the legal and reputational risks associated with chemicals in products and to take advantage of the related opportunities, knowing and understanding what chemicals are included in one´s products is key. In other words: chemicals used in leather need to be traceable in order to meet the existing and future requirements of regulation, brands, consumers, and NGOs. This is also the result of a scenario building process in which stakeholders from the leather sector developed a common understanding of how a more sustainable leather chemistry can succeed in the future (2035). In a subsequent strategy process, the group of actors identified the traceability of chemicals as a key lever to work towards the target scenario. Thus, a specific subproject was launched under the project named "IT Tools and Governance for Traceability of Chemicals."

Governance framework to create trust

The project's aim is to develop, in a multi-stakeholder approach, a shared understanding about reporting rules so that not every single company in the leather industry invents its own traceability systems with rules. If the sector can agree on one system, reporting will be more efficient. More importantly, such governance framework must lay the foundation for trusted communication throughout the supply chains, resulting in relevant and reliable information.

Pilot study with IT tools

Thus, technical testing of an exemplary IT-Traceability-Tool was only one aspect of the project. It delivered proof-of-concept that an existing material data system / traceability tool can be adapted to the leather industry. It showed that traceability of chemicals in leather products can succeed, as well as the advantages and limitations that may arise.

The pilot company Ricosta, a German children shoe manufacturer, that tested the IT-Traceability-Tool, presented alongside h_da the results of the pilot study and discussed them with stakeholders from brands, tanners, chemical industries, certification schemes etc. during workshops in order to draw initial conclusions.

The reporting approach can be summarised as follows: for a company to know exactly which chemicals are present in the product it places on the market; all upstream suppliers will report information to their downstream users/customers. This means that a "data requestor" (e.g. brand, retailer, tier1, tier2,...) will receive a Bill of Materials (BOM) listing the chemicals present in his/her article. It is intended, that a "data requestor" only communicates with the direct supplier while he/she cannot access the identities of other (sub)suppliers in the value chain. Thus, to report all chemicals along the leather supply chains, all suppliers will have access to such an IT tool (or adequate interfaces in regions with poor IT accessibility).

With the survey, we hoped to gather information from various stakeholders about what they believe makes the IT-Tool valuable and what should to be left out and why.

Before we get to the survey, the listing below highlights the benefits of an IT-Traceability-Tool for leather supply chains.

[2] Chapter 3.4 on Policy Impulses from the EU Green Deal.

Picture 1 IT Tool Benefits

Picture 2 IT Tool Benefits (continued)

2. Results of the survey

The survey consisted of over 42 pages of a questionnaire and was fully completed by 21 organisations/ participants. We noted that there were plenty of participants who started but did not finish the survey, which may show how demanding and complex the topic is.

However, as shown below, the participants of the survey have different roles in the leather sector and are active in most of the relevant product groups and also, nearly all regions of the world are covered.

Product group(s) relevant for activities	
Shoes	15
Fashion	13
Accessories	11
Furniture	15
Automotive	14
any leather application	1

Table 1 Product groups relevant for participants' activities

Region	
Europe	15
Asia	8
North Amercia	3
Central America	3
South Amerca	3
Oceana (e.g. Australia, New Zealand, ...)	3
Africa	5
Middle East	3
Global	9

Table 2 Regions of participants

Role in the leather sector	
Chemical supplier	3
Slaughterhouse/abbtoir	
Tanner: pre-tanning	3
Tanner: tanning	3
Tanner: finishing	3
Trader	
Leather (products) manufacturer	2
Brand	3
Retailer	
Wholesaler	
Importer	
NGO	2
Consultant	7
Certifier/Inspector	2
Other	5

Table 3 Roles of participants

Chemicals in the scope of IT tools for traceability

In terms of chemical reporting, there was a fundamental question regarding: What should be entered into an IT tool? Only chemicals that remain in the product? Also, the process chemicals that are important for the process and that are not actually intended to be present in the finished product?

The survey defined different sections, and the questions were separated into three sections that refer to

A: Chemicals present in the materials/products

B: Process chemicals (auxiliaries and reaction products)

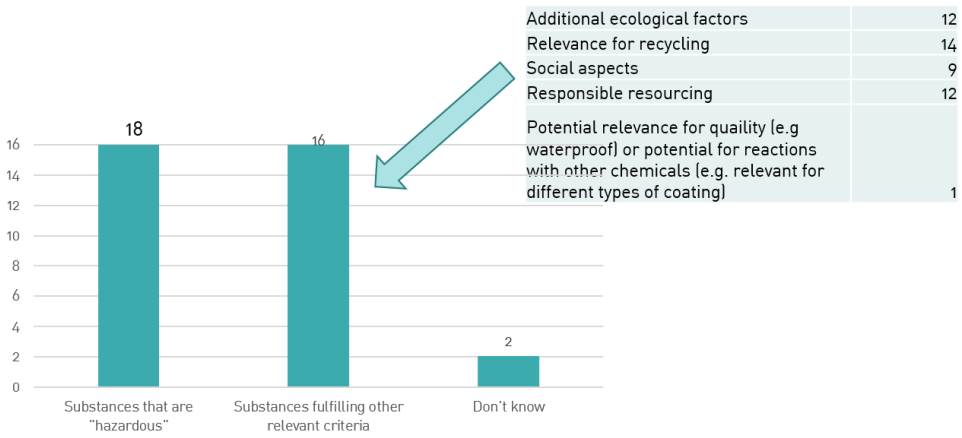
C: Additional aspects

It was explained to the participants that the IT-Traceability-Tool will facilitate the reporting of all chemical substances present in a leather article (and its materials) as identified by their CAS number or similar. The CAS number is used internationally to identify chemical substances. There might be justified reasons for exemptions from the reporting obligation in defined cases. Substances listed on the substance reporting list, however, have to be reported in any case.

A: Chemicals present in the materials/ products

Nearly all participants answered the question of what should be reported on a Substance-Reporting-List (SRL) that substances that are hazardous need to be included. However, 16 participants also said that these need to be complemented by substances fulfilling other criteria, such as relevance for recycling (14 votes), additional ecological factors (12 votes), responsible sourcing (12 votes), and social aspects (9 votes).

The Traceability IT-system needs a **SUBSTANCE REPORTING LIST (SRL)** on chemicals in materials. What criteria can trigger the inclusion of chemicals to such a list?



Additional ecological factors	12
Relevance for recycling	14
Social aspects	9
Responsible resourcing	12
Potential relevance for quaility (e.g waterproof) or potential for reactions with other chemicals (e.g. relevant for different types of coating)	1

Table 4 Chemicals in articles - Contents of SRL

*According to the European Chemicals Agency (ECHA), hazardous substances refer to "substances with properties that are harmful for humans or the environment".

Customers/data requestors (e.g., brands, retailers) within the supply chain can demand their suppliers to report against predefined lists of substances provided by the IT-Traceability-Tool.

To the question of which existing substances lists on chemicals present in materials, e.g., regulatory lists such as the REACH SVHC list, should be embedded into the tool, the participants provided answers such as REACH SVHC, Prop 65, lists from CADS, ZDHC, Oekotex, etc. as the picture below shows. Also, there were comments on the enhanced transparency on the one hand (the more lists, the better), but also concerns about the complexity and adoption on different units.

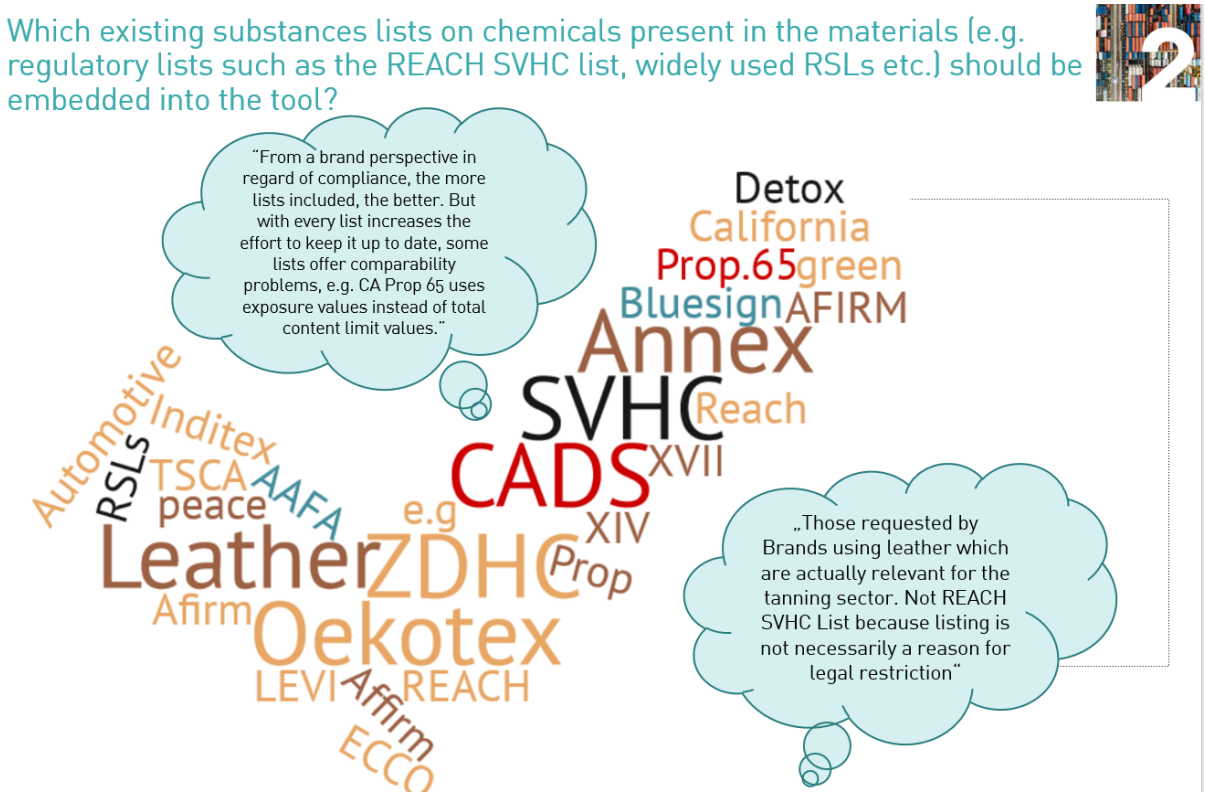


Figure 1: Chemicals in articles - Substance Lists to be considered

The below listing shows the answers of the participants to the question of which additional substances or groups of substances (e.g., those which are usually not covered by the lists mentioned in the question at the top) should fall into the scope of the reporting via the IT-Traceability-Tool.

Additional substance groups to be added mentioned

What	Who
Recycle contents/ components	Brands
Skin sensitisers	Leather Association
data on CO2-emissions producing chemicals, water usage and other ecological effects	NGO
sector specific/ product specific lists (many times yet tbd)	Consultant
Bisphenols, D4, D5, D6 containing products, products based on renewable raw materials	Chemicals
Biocides	Chemicals
Bisphenol, Aldehydes, Chrome, VOC, TOC	Consultant
plastic	##

Table 5 Chemicals in articles - additional substance groups to consider and type of actor providing the answer

In contrast to the above, participants also commented on what should **not** be reported, including impurities and in general substances that are used in the context of processes, e.g., machinery, ETP, etc.

B: Process chemicals (auxiliaries and reaction products)

In the manufacturing process of leather, three types of "process chemicals" are used.

a) Process chemicals that remain in the article are covered by the previous section A.
b) Additionally, there are auxiliaries that do not remain in the leather and
c) After tanning. reactive products no longer have the identification (e.g., CAS number* or similar) as in the chemical formulation. The questions in this section B "Process Chemicals" focus on the latter two categories, auxiliaries and reaction products.

Nearly all participants answered the question of what should be reported within a Substance-Reporting-List that substances that are hazardous need to be included. However, 11 participants also said that these need to be complemented by substances fulfilling other criteria, such as additional ecological factors (10 votes), responsible

sourcing (9 votes), relevance for recycling (8 votes), and social aspects (6 votes).

In terms of additional substance lists, aside from ZDHC lists, additional lists on chemicals regulated in China were mentioned.

In contrast to the above, one participant said that installation cleaning chemicals or similar should not be part of the reporting as they would not have relevance for leather. This is a comment in addition to others discussed later in our workshops.

The Traceability IT-system needs a substance reporting list on chemicals in processes. What criteria can trigger the inclusion of chemicals to such a list?

Additional ecological factors	10
Relevance for recycling	8
Social aspects	6
Responsible resourcing	9
waste water regeneration	1
quality	1

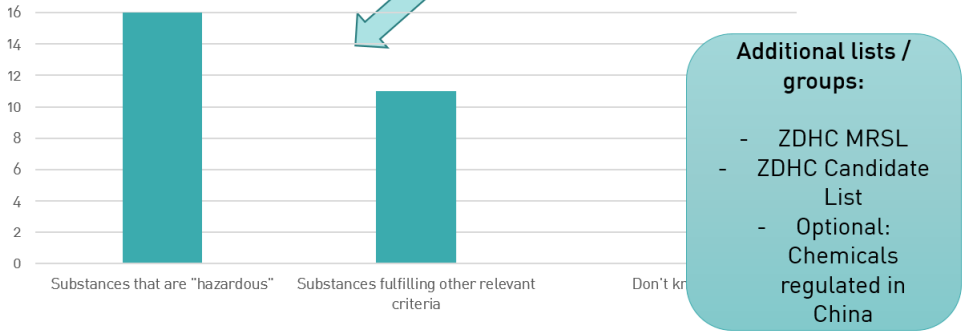


Table 6 Chemicals in processes - SRL

C: Additional aspects

Apart from chemicals, the IT Traceability-Tool could capture other information, such as data on occupational health, environmental aspects, and social aspects. The following tables show given answers to the related questions. Clearly, there is a tendency towards the reporting of information other than chemicals.

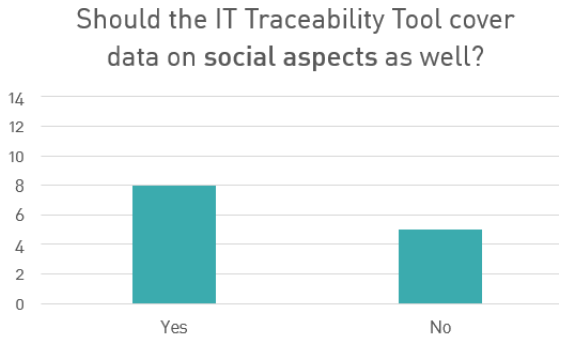


Table 7 Other aspects - Coverage of social aspects

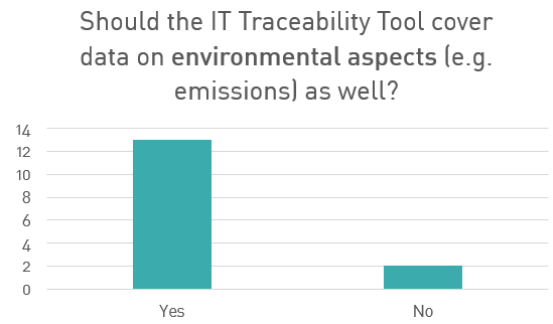


Table 8 Other aspects - Coverage of environmental aspects

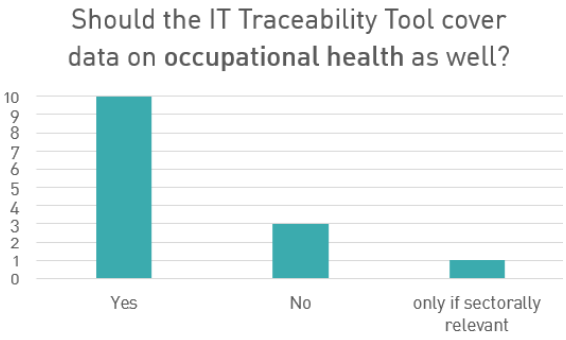


Table 9 Other aspects - coverage of occupational health

Some of the participants wrote in the blank fields that, e.g., data on CO2-emissions producing chemicals, water consumption, and other ecological effects/ further climate and biodiversity effects should be reported as well. Also, in terms of a water footprint, to allow for chemicals that allow for less water consumption in the process, even if they are not based on renewable resources. Another aspect seems to be data on recyclability, i.e., recyclable contents and components.

In contrast to that, at least one participant recommended not to include further aspects apart from chemicals contained in products under the IT-Traceability-Tool as this risks increasing the complexity of the system.

3. Conclusion

The survey was fully completed by 21 organisations/ participants from various sectors. Though this limited number may not be representative, most participants showed a strong support for a broad scope of chemicals and additional aspects to be reported under an IT tool to trace chemicals along leather supply chains. This underpins a trend to support and achieve more transparency.

Traceability is key to ensuring compliance with legislation and remaining competitive in the future.

This subproject focused inter alia on the possibilities and limitations of reporting leather chemicals through case studies, using an example of an existing IT tool, and discussing these with the actors from the field. A summary of relevant discussions is available on the project website. The project developed proof of concept that the traceability of chemicals in leather is technically feasible although there are challenges to overcome.

Apart from the benefits, implementing traceability is burdensome, at least in a short-term perspective where investments are necessary. Besides, the approach implies an essential change in professional routines.

However, harmonising the reporting approach will contribute to lower these burdens.:

The traceability approach can only work if it is embedded in a mutually agreed-upon governance framework.

To this end, it will be necessary to establish a dialogue within the leather sector to achieve a common understanding for a framework or industry-wide standard.

The work of the project "More sustainable chemistry in the leather supply chains", including the findings from the survey as well as the network of actors established, provide the foundation to initiate this process.