



Sustainable Leather Foundation's pathway to Responsible Chemistry



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Introduction

Green chemistry is at the heart of responsible chemistry. The green chemistry revolution has been helping drive environmental, social, and governance solutions for industries that use chemicals.

A green chemical focus is on safe, efficient, and pollution minimising synthesis and use. There are some core elements that green chemistry aspires to, and the leather chemical users should consider them when deciding the sustainability of a chemical:

1. Use catalysts, e.g., enzymes to make the reactions more efficient.
2. Minimise the use of flammable, volatile, or toxic solvents.

3. Consider atom economy – use as few as required.
4. Design safer syntheses, use of that chemical, and environmentally protective disposal or recycling.
5. Ensure the use of the chemistry is energy efficient – lower temperature of use or synthesis.
6. Chemicals should be made from renewable feedstocks, preferably waste or recycled chemistry.
7. Spectator chemicals, e.g., salts or blocking/protective groups, should be avoided.
8. Chemicals and products should degrade after use, or at the very least be reusable/recyclable.
9. Diligent chemical use should avoid and/or prevent accidents.
10. The use of chemicals should be monitored in real time to assess reaction or use – providing data on uptake.

Clever design of processes and products that carefully considers ingredients, is critical going forward.

Facilities in the value chain can no longer just use the chemistry that they have traditionally relied upon – as new safety and environmental understandings become known.

The makers of the chemicals, the users of the chemicals (facilities) and the end user of the materials that contain the chemistry need to know more about the ingredients in leathers.

Regulation and Testing

The use of chemicals in factories, the materials that contain ingredients, and the impacts of those chemicals that enter the environment on purpose or by accident are now under the watchful eye of regulatory authorities. Multiple lists of concern began rising to the forefront from the 1970s onwards. The 1976 Toxic Substances Control Act (TSCA) and its offspring like the California Proposition 65 law sought

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to protect drinking water. Environmental Protection Agencies in the USA and in Canada began the regulation of chemistry.

The European Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) that was published in 2006 has again created a suite of offspring like the Chinese, Taiwanese, Korean and UK REACH. The REACH regulation and the Restriction of Hazardous Substances (ROHS) Directive from the EU have also been adopted globally.

These regulations focus on information, and they are also complimented by the labelling systems that can be found under the CLP and GHS systems. All the above regulations are intended to inform and create awareness on the risks associated with chemicals.

Petroleum-based carbon chemistry (made from fossil oil) has its place in the responsible use of substances, as does biobased carbon chemistry (that is substances that have their origins linked to natural biological substances). Scientists increasingly favour biobased chemistry for sustainable reasons.

Exposing humans (workers and end-users), animals, or the environment to the harmful effects of chemicals in manufacturing or in the final products going to consumers is a big part of the consideration producers need to give in their due diligence. It is no longer acceptable that the manufacturers of products who make materials don't think about the chemicals they use – their responsibility is to think about the chemicals through the entire life cycle.

As producers look to the economic models on how their fabrication and life cycle will operate, they will see that linear life cycles (production to disposal) are no longer suitable. Circular models that look to loop ingredients back into future production cycles is key to future business success.

The information is one part of the message, as is the testing of products to ensure that not only do they contain the intended chemicals, but also to check the presence (or absence) of un-intended chemistry. Test houses and chemical producers have a key partnership together with the leather manufacturers to decrease the restricted chemistry in future materials.

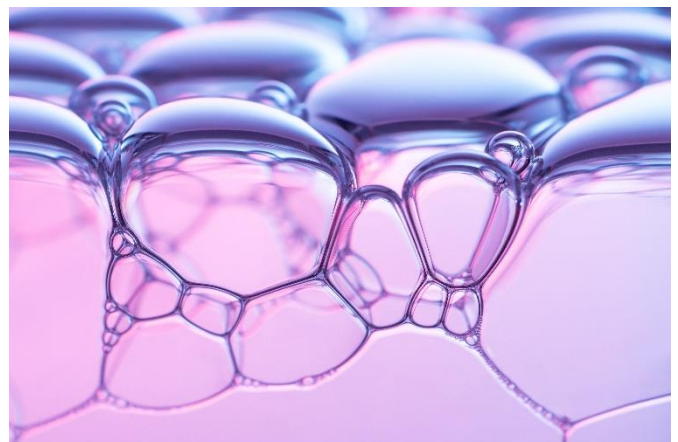
SLF Approach

Along with the efforts by the chemical producers, leather producers, product manufacturers, and retailers the communication of the types of chemicals used in products has become more important than ever. Allergy or sensitising information, ethical and moral choices, and environmental or social impact considerations are key to consumer market choices. SLF endeavours to work with and help co-ordinate discussions amongst chemical partners.

SLF also seeks to grow the levels of green chemistry that are represented in the 10 criteria given above. As a positive driver towards these choices the Foundation looks to motivate and encourage facilities to move ever further to meet as many of the criteria as they can.

The Foundation has placed responsible chemistry into the heart of the Audit Standard as it feels that the key to good human and environmental safety comes with responsible chemistry. Chemical choices have ESG (especially financial) implications that help a facility to satisfy ever increasing considerations of concern.

To ensure that the farming, chemical production, leather production, product manufacture, retail, in-use, and end-of-life phases of the life cycle always handle and store the chemicals safely the Foundation uses its standards and benchmarks to identify best practice. The end-of-life impacts are also included as part of the SLF's circularity approach.



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Tools

The Sustainable Leather Foundation's tools (available through the web page) and Foundation partnership provide a key mechanism to enhance knowledge about chemical handling and use.

By working with industry and non-industry stakeholders, the Foundation takes the best ideas and thinking (published evidence) and translates them into technical positions and guidelines. These can be used to help provide critical value chain advice that scale solutions.

The Sustainable Leather Foundation's audit standard is built on the idea that responsible chemistry is a critical part of a whole balanced system and that the Foundation's ESG audit will identify (as a whole) whether the leather chemistry is sustainable or not. The explanatory notes and the standards and benchmarks support the work outlined in the audit standard. A tannery or chemical supplier is encouraged to work with the Foundation to improve the evidence base and the quality of the standard/benchmarks used. The global industry can always improve the quality of the information it uses.

SLF's Transparency Dashboard™ will clearly indicate a value chain partner's ability to demonstrate their own careful thought and deliberation on what level of responsible chemistry is being used in their materials.

Future

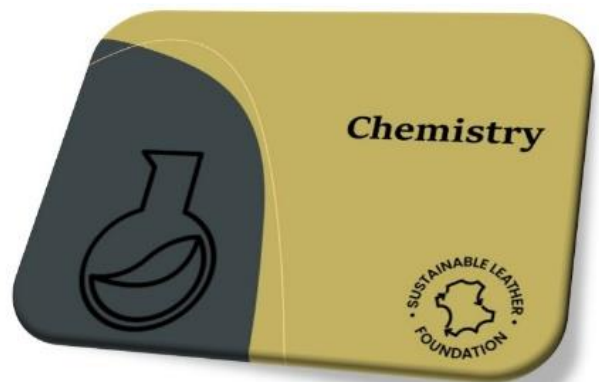
The Sustainable Leather Foundation recognises the need to consistently increase the use of green chemistry. Sustainable chemistry that achieves as many of the 10 criteria that are listed above is a common aim. Going forward, consumers will continuously strive to have more natural materials that can give them a peace of mind (for the environment and for their health) when they interact with those materials. Leather that is made using responsible chemicals, or in factories where workers know that the chemicals they are working with are safer, must be a superior material to leathers that are made with less safe chemicals.

The Foundation through its work on the Audit Standard and its involvement in tools that can help rank and understand which chemistry is the most suitable for

leather making. SLF would then feed this information back into global best practice and understanding with respect to manufacture and use.

Responsible chemistry can only be achieved through agreements by all interested parties and whilst respecting the old ways, can also listen to suggested issues, understand modern risks, act with due diligence and can strive to continuously improve processing at large.

The Foundation seeks a pathway to balance that protects people, the planet and is economically viable for the benefit of future generations.



SLF is leading the mission across our industry towards Responsible Chemistry through the adoption of our Responsible Chemistry Charter and Pledge. Those that join will receive the Sustainable Leather Foundation's seal of "Good Chemistry" to promote their commitment to removing "Forever Chemicals" PFAS (per and polyfluorinated alkyl substances) from leather production. Please visit [SLF's website](#) for more information to join our Charter and Pledge today!



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