



HOHENSTEIN

WHITE PAPER

How to lower the apparel, footwear, and textile industry's impact through systematic, data-based input control



Protecting people & planet using greener chemistry & testing

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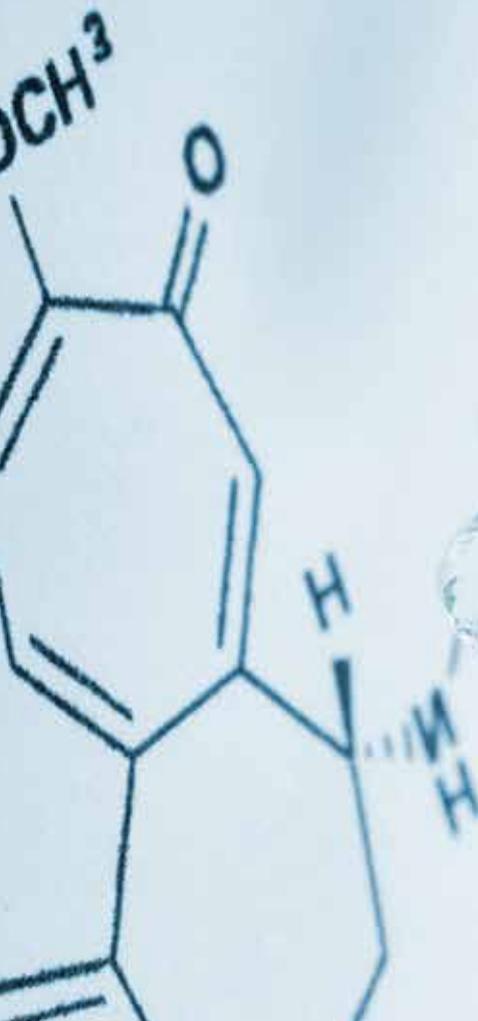
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Abstract

The production of apparel, footwear, textile and leather is chemically intensive. Input chemistry has a significant effect on product safety, the environment and circularity.

Greener chemistry proactively removes hazardous substances before they enter supply chains. It is far more effective than rejecting unsafe finished goods or reversing environmental damage. A testing and certification system enables suppliers to select better chemistry and prevents toxins and impurities from entering factories, products and ecosystems.

OEKO-TEX® ECO PASSPORT is an independent certification system for chemicals, colorants and auxiliaries used in the apparel, footwear, and textile industries. ECO PASSPORT uses a systematic screening and testing approach to promote compliance, confidence and cost efficiency. In just five years, it has grown to cover approximately 21,000 chemical products that meet the strict criteria for ecologically responsible manufacturing. Brands and factories value ECO PASSPORT as credible third-party chemical validation and suppliers of those chemicals use the built-in feedback mechanism to improve products and processes.





The apparel, footwear and textile industries have a chemical problem.

What goes in, must come out.

Chemicals and dyes used in the production of textiles and leather are not typically food grade quality, nor do they have pharmaceutical purity. Impurities and harmful substances found in textiles, leather, foams, adhesives, prints, metal items and other components of apparel, footwear, and home goods can have a negative impact on worker and consumer health. If chemicals used in production do not remain in or on the product, they are released into the environment during manufacturing or consumer use. Either result can harm humans and ecosystems.



Regulations and supply chains are complicated.

Many industries face challenges with chemicals. Regulations differ between local and national governments. Increased scrutiny from regulators, NGOs and consumers is focused on textile sustainability and worker protection. Meanwhile, supply chains continue to expand, often through contract manufacturing models, while technical resources are decreasing at the brands, factories and mills.

One of the greatest challenges the apparel, footwear and textile industry is not knowing how many single chemicals are entering facilities. It is estimated that 4,000 to 8,000 individual CAS number chemicals are being used. This broad range doesn't begin to cover the number of formulations.



Traceability and design thinking are critical.

Supply chain traceability and metrics are essential. Unfortunately, the prevalence of supply chain tracking for chemicals is extremely low for apparel, footwear, and textiles. Without the right tools in place, brands and retailers risk exposing their customers to harmful chemicals.

Tracing materials is also essential to sustainability efforts, such as recycling. Products designed with circularity in mind make way for the reuse of (scarce) raw materials. Reuse can mean fewer chemicals are utilized in the production process. Reducing the use of harmful chemicals at the input stage of production is an important benefit of the circularity and recycling movements.

Responsible chemical management can be achieved.

Use harmonized restricted substance lists.

Once supply chains began to expand and globalize, companies could no longer rely only upon local relationships. Suppliers and brands need to know their products will stand up to global standards.

One of the first restricted substance lists (RSLs) in the textile industry was created in 1992 by OEKO-TEX®, an association of textile and leather testing institutes. The list of substances, test methods and limit values are updated regularly to account for global legislation, new production methods and scientific data. Currently, OEKO-TEX® bans or restricts over 1500 CAS numbers for use in manufacturing or as residuals in apparel, footwear, textiles and leather. The restrictions are harmonized globally regulation and industry initiatives such as AFIRM, AAFA, ZDHC and REACH.

In 2011, Greenpeace launched its Detox campaign, challenging the apparel and footwear industry to eliminate the discharge (and when possible, use) of hazardous chemicals. As chemicals are generally used in shared facilities, brands began a collaboration that led to the formation of ZDHC (Zero Discharge of Hazardous Chemicals). Six original signatory brands committed to a joint roadmap for eliminating the discharge of hazardous substances and accelerating progress toward safer production and cleaner discharge pathways. The ZDHC Manufacturing Restricted Substances List (MRSL) and other guidelines continue to be implemented throughout the industry to facilitate chemical management and traceability. OEKO-TEX® ECO PASSPORT is a third-party verification system recognized for ZDHC MRSL conformance.

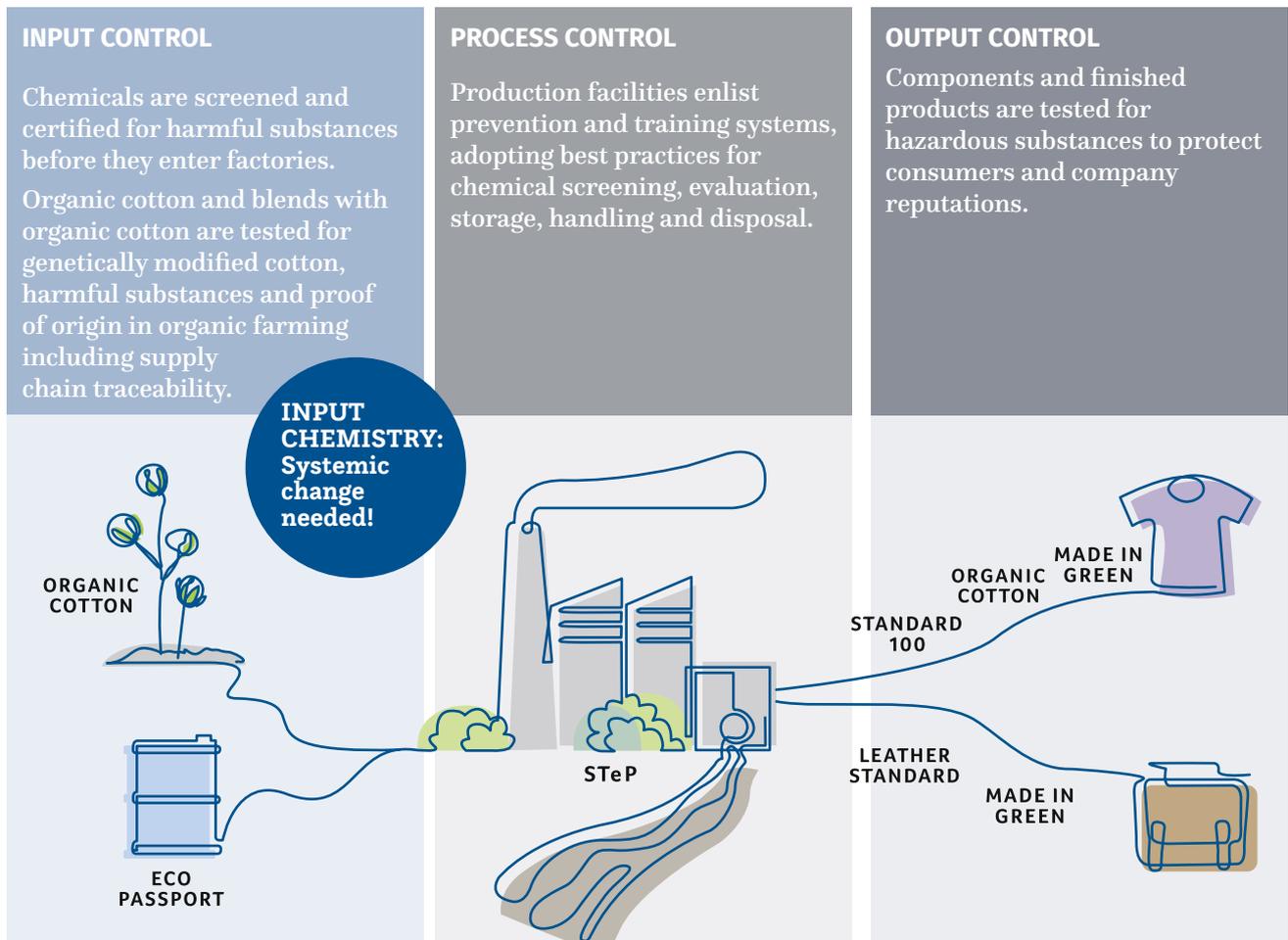


The toxicological expertise, industry-specific knowledge and resources required to develop and maintain the full suite of supply chain standards is unattainable by most individual companies, which is why over 21,000 companies hold traceable OEKO-TEX® certifications and many more use the RSL/MRSL. The OEKO-TEX® standards and tools help deliver safer and more sustainable products while easing the supply chain's burden.

Systematic controls are needed at each stage.

While product stewardship will always be necessary, a sole focus on the finished good is neither comprehensive nor efficient. Brands are beginning to take responsibility for their entire supply network, going far beyond the traditional tier one supplier relationships. The most proactive are working to prevent harmful chemicals from entering factories at all.

CHEMICAL MANAGEMENT and PRODUCT STEWARDSHIP can be engaged at three stages:



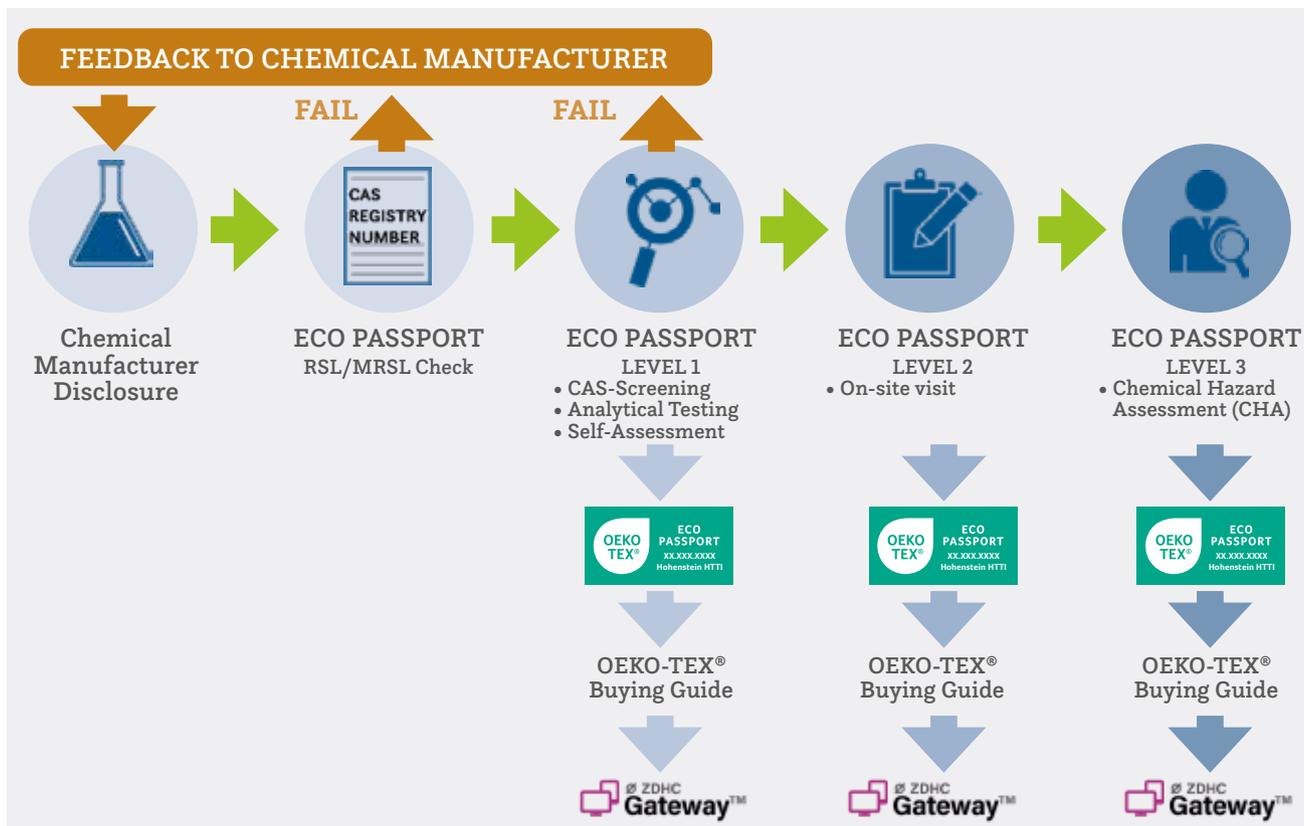
Through the understanding and development of systems, better chemicals can be pulled through supply chains. The need for safer products (OUTPUT) means that factories will use safer chemicals (PROCESS), and chemical suppliers will produce safer, greener chemicals (INPUT). When the right levers are pulled in “the system”, the outcome is better all around.

Certification without testing is risky.

Many chemical suppliers have robust systems and procedures for managing their dyestuffs and chemicals. Reviewing formulations to prevent chemicals of concern from being intentionally used is a necessary step toward chemical management. However, a review of what is thought to be in a formulation can miss the mark if the ingredient list is incorrect or if there has been contamination from impurities or incorrect storage.

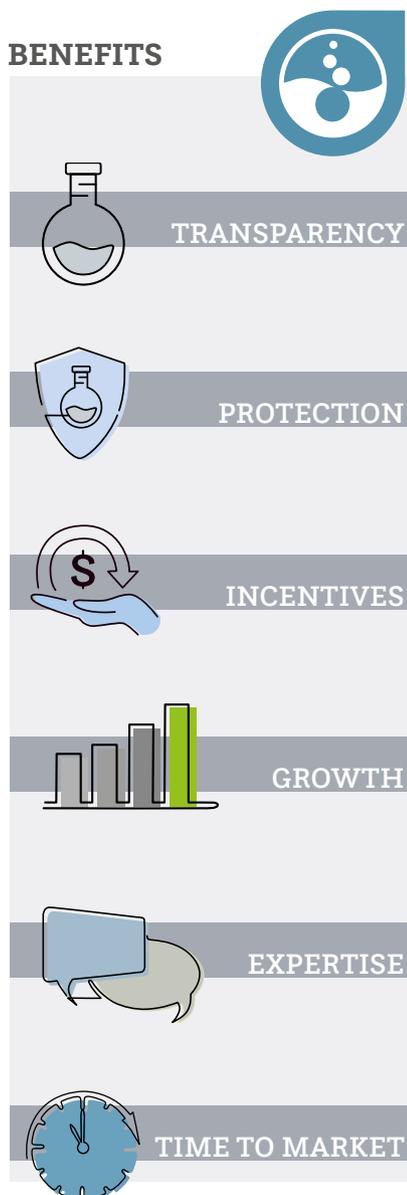
A robust and reliable certification system requires both CAS number ingredient document checks and regular testing. Finding and eliminating hazardous substances and contaminants improves the end consumer product, lessens environmental impact and helps the chemical supplier improve their formulations as well as preserving their reputation.

ECO PASSPORT Chemical Assessment | Systematic evaluation of input chemicals with feedback



For example, OEKO-TEX® ECO PASSPORT targets chemicals, colorants and auxiliaries used to manufacture apparel, footwear, and textile. The multi-stage verification process analyzes whether chemical products and individual ingredients meet specific requirements for sustainability, safety and statutory compliance. The ECO PASSPORT requires CAS number screening and analytical verification (testing).

Because it is part of the traceable OEKO-TEX® system, ECO PASSPORT certified chemicals reduce risk and testing costs for downstream customers. ECO PASSPORT limits are directly tied to STANDARD 100 and OEKO-TEX® LEATHER STANDARD product certifications for harmful substance safety and harmonized with OEKO-TEX® STeP facility certification for worker and environmental protection.



Smart testing and feedback.

Trust, verify and repeat.

Testing chemicals is the only way to detect impurities, accidental or otherwise. Regular testing ensures that quality systems are working consistently. Without this verification, a CAS number screening is based on theory.

To maintain a trustworthy, yet economical certification, ECO PASSPORT works to minimize both testing burden and risk. The reality-based testing matrix includes the critical substances for each chemical group and type. It also determines frequency of testing based on risk. Higher risk substances are tested more often. Less risky substances are spot checked. Others are only control tested.

The original ECO PASSPORT matrix was created by OEKO-TEX® member institutes who had been testing textile chemicals for decades. It is adjusted each year based on thousands of test results. Special attention is paid to changes in the number of failures and fails above the limit values. Increased failures one year mean increased testing for that substance in the future. A substance with no findings from a significant number of tests is a candidate for lower testing frequency. Any decision to change test frequency is monitored with spot checks.

ECO PASSPORT's impact has grown for five years.

Since ECO PASSPORT's launch in 2016, almost 21,000 chemical products are now certified, influencing the production of millions of textile and leather products. In turn, consumers, workers and the environment have been positively impacted.

The certified chemical suppliers are easily accessible online in the free, [OEKO-TEX® Buying Guide](#) and listed on the ZDHC Chemical Gateway at conformance level 1, 2 or 3, depending on certification level.

Feedback improves chemical products and confidence.

Testing data supports certification integrity and product quality. Approximately one percent of ECO PASSPORT tests have resulted in a failure during certifications or renewals. These substances are proven hazards to children, consumers, workers and the environment.

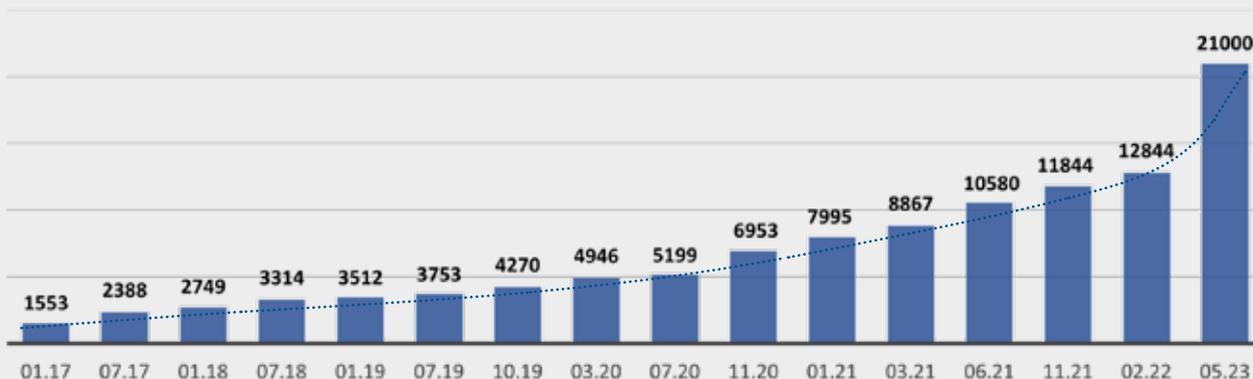
The discrepancies between disclosed ingredients and reality are often unintentional. Some failures come from a bad sampling procedure. For example, hot melt adhesives often fail tests for heavy metals because samples are spread onto a metal surface to cool down. Also, a new failure on renewal could signal an unreported change in process or sourcing. Most often, failures are caused by an incorrect or contaminated ingredient. One supplier of printing auxiliaries found that its dyestuff had metallic catalysts for synthesis and was able to substitute with a safer ingredient.

Contaminations although not intentionally added can also be the result from manufacturing issues, handling procedures, reaction to transport vessels or changes made by a supplier. Most ECO PASSPORT applicants, although previously unaware of the issue, will use the feedback and collaboration to resolve the situation.

The ECO PASSPORT failure feedback serves as a “mini alternatives assessment” for chemical suppliers. Chemical suppliers are in the best position to know why their formulation contains a chemical of concern and what could be a safer alternative. Many failures have led to improvements in the chemical company’s supply chain or processes.

ECO PASSPORT - Certified Chemical Products

Certified Chemical Products



The wheel has already been invented.

Protecting people and the planet with greener chemistry requires proactive elimination of hazardous chemicals. It involves transparent communication, worker training, careful monitoring and storage. It means global monitoring of laws, restricted substance lists and suppliers. These efforts are especially challenging in the long and complicated supply chains most common in apparel, footwear, leather and textile industry.

No company can do it alone. All of this is easier through collaboration. Industry initiatives and respected independent certification systems already exist. They update standards, harmonize across the industry and verify through testing.

To learn more, please visit [hohenstein.com/eco-passport](https://www.hohenstein.com/eco-passport).



Use Greener Chemicals.

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