

Levi Strauss: avoiding regrettable substitution

The US apparel company invented the world's first pair of blue jeans and now has around 500 stores across the world, with products sold in 110 countries.

Levi Strauss says it was one of the first companies in the industry to develop a restricted substances list (RSL). According to the company, this meets and, in many cases, exceeds, all global regulatory requirements. Chemicals on this list – and on its manufacturing restricted substances list (MRSL), include:

- » 11 priority chemical groups, as identified by Greenpeace and the apparel industry's zero discharge of hazardous chemicals (ZDHC) group: alkylphenols, phthalates, brominated and chlorinated flame retardants, azo dyes, organotin compounds, perfluorinated chemicals, chlorobenzenes, chlorinated solvents, chlorophenols, short-chain chlorinated paraffins and heavy metals;
- » substances on the California Department of Toxic Substances Control (DTSC) list: alkylphenols, aromatic amines, azo dyes, perfluorinated chemicals, formaldehyde, phthalates and triclosan; and
- » substances on the ZDHC's manufacturing restricted substances (MRSL) list.

The company says it makes sure that, prior to its screening process, all chemical formulations are reviewed by a third party to identify if any of these substances are present. If the formulation or substance does not meet the RSL's requirements the chemical supplier is notified.

GreenScreen

Bart Sights, vice president of technical innovation at Levi Strauss, says the biggest challenge is understanding the hazard and risk profile of the chemicals present in raw materials, but without compromising suppliers' intellectual property (IP).

"In order to make better choices on chemistry in the development process, before chemicals enter the supply chain, this information is critical. To solve this, we've

developed a programme using a third party assessor that provides the information we need to make decisions, but safeguards the IP of chemical suppliers," he told Chemical Watch.

This programme, called GreenScreen for Safer Chemicals, is used in addition to the US EPA's Safer Choice Programme. Both are chemical hazard assessment methodologies that look at a variety of human health and environmental toxicity hazard endpoints.

Mr Sights says GreenScreen provides "greater visibility into the chemical substances used by our vendors to create garment finish effects." It allows Levi Strauss to share a preferred chemicals list of all chemicals screened to date and their scores, with suppliers. Chemicals are scored as green, yellow or red via a point system, allowing the company and its vendors to select the best alternatives within chemical categories.

Identifying substances of concern

In a case study published earlier this year, Levi Strauss outlined how it assessed a substance of concern and successfully switched to a safer alternative.

The product was its Commuter line of denim and non-denim apparel, designed primarily for men commuting to work by bicycle. It says it needed to have a durable water repellent to protect from rain, and for this selected Nanosphere, a nanotech-based finishing technology.

But Nanosphere contains short-chain perfluorinated chemicals (C6) which, following a review, Levi identified as a class of chemicals to eliminate from its products by December 2015. Because of this, it "immediately began to search for a replacement," the case study says.

It also notes that short-chain PFCs are not currently regulated and do not have a mandatory classification under the EU's classification and labelling (CLP) Regulation. But the evidence that long-chain PFCs, such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonate acid (PFOS) are harmful to human health and the environment is well documented, it says.

Furthermore, Levi Strauss says "although there is much less available data to demonstrate the theory held by certain sectors in the science and NGO communities is that the molecular structure between short-chain and long-chain PFCs is so similar that short-chain PFCs may also be persistent, bioaccumulative and toxic (PBT)". In line with the precautionary principle, the company made the decision to replace the substance of concern with a PFC-free alternative, by following its six steps towards substitution (see box).

The primary focus was to make sure the alternative chemical did not turn out to be a 'regrettable substitution', and subsequently be identified as just as hazardous as the chemical it was trying to replace. Of particular importance were PBT and carcinogenic endpoints, because they were the endpoints of concern in long-chain PFCs that it was seeking to replace.

Maintaining existing relationships

The chemical of concern was marketed by Schoeller Tech, part of Swiss firm Schoeller Textiles. Levi Strauss wanted to maintain its positive relationship with the company and work with it to find a safer alternative. The case study explains that, in 2013, Schoeller had launched a PFC-free replacement technology called ecorepel, based on substances that are not classified as hazardous.

Levi Strauss asked Schoeller to supply:

- » safety data sheets for all components;
- » data generated by Schoeller that proved the replacement was not hazardous; and
- » registration through REACH and access to the REACH dossier.

Levi Strauss's product team then "reviewed the SDSs to see if any regulated chemicals were included", the case study says, and, "in the case of both components, the chemical ingredients were not regulated and were considered safe to use." Meanwhile, it conducted a review of other alternatives to PFCs already on the market.

Next, it used the GreenScreen method to assess and evaluate ecorepel. This showed that its active ingredient met the company's criteria.

Its cost and performance were then assessed and were found to be equally matched with the original product and so successfully switched to the safer alternative.

The company says it has not been able to achieve the same performance standards using any other PFC-free technology, other than ecorepel. But the product development teams continue to research all PFC-free chemistries and a comprehensive review of these was to be conducted this summer to impact decisions made for products sold next year.

Steps towards substitution

- » identify the chemical of concern: Levi describes the hazard, the function of the substance and the current conditions to make it work at the desired performance level;
- » set substitution criteria: through its RSL process, it sets limits to eliminate unsafe criteria. It then aligns with the regulatory and legal environment of the countries in which it operates and sells;
- » identify alternatives from chemical suppliers: it engages with chemical suppliers to discuss chemical sustainability, hazard, risk and exposure, and works with them to find safer alternatives for chemicals of concern;
- » assess and compare alternatives: Levi asks suppliers to share what hazard assessment methodology and tools they use to identify safer substitutions;
- » pilot substitution for performance: it evaluates the chemical through its GreenScreen process to ensure the performance meets customer expectations; and
- » encourage chemical supplier to post a substitution case study: after third-party verification, Levi encourages the supplier or other organisation to post a substitution case study on the Substitution Support Portal (Subsport).

Source: Levi Strauss's case study on phase out of short-chain C6 perfluorinated chemicals (PFCs) from Apparel, May 2016.