

Communicating Chemicals in Products

Global guidance on providing voluntary chemical-related sustainability information for products



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About the One Planet Network Consumer Information Programme

This document is an output of the Consumer Information Programme of the 10 Year Framework of Programmes on Sustainable Consumption and Production (known as the One Planet network). The Programme is a global platform supporting the provision of quality information on goods and services, to engage and assist consumers in sustainable consumption. It implements and supports projects, undertakes research, shares good practice and policies, and provides collaboration opportunities. The Programme is led by the Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU), Germany; the Ministry of Environment and Forestry of Indonesia, and Consumers International; and brings together a network of public, private and third sector actors.

More information, and ways to participate, can be found at <http://www.oneplanetnetwork.org/consumer-information-scp/> or contact ciscp@un.org.



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This document draws upon the high-level principles of the [Guidelines for Providing Product Sustainability Information](#), a useful tool that outlines a framework to strengthen product sustainability information, and discusses them in the context of chemicals in products.

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1 INTRODUCTION AND BACKGROUND




1.1 WHY CHEMICALS HAVE A KEY ROLE TO PLAY IN SUSTAINABLE CONSUMPTION AND PRODUCTION

All products of modern life contain chemicals as material ingredients. This includes, for example, clothes, food, furniture, cosmetics, packaging, toys, electronics, and the materials that make up our homes. It is estimated that between 40,000 and 60,000 industrial chemicals are on the market globally ([ICCA-se, 2019](#)), with around 6,000 substances making up over 99% of the total volume of chemicals.

Chemicals perform many useful functions in these products, but some chemicals can also cause adverse impacts on human health or the environment at one or more life cycle stages of products. Commonly used chemicals have been detected in environments and locations they were not intended for. For example, concern has been raised about the detection in soil and water of highly persistent per- and poly-fluorinated alkyl substances (PFAS), used in fire-fighting foams, waterproof clothing and other products. Certain phthalates, commonly used to soften plastic, have been linked to adverse health effects and are being detected in humans and animals. Overall, there is a growing awareness on the impacts of hazardous chemicals, as for some of them, their presence and effects are being increasingly measured and seen.

Table 1 - Examples of SDGs addressed by more sustainable consumption and production in relation to chemicals and waste and consumer information provided

SDG	Targets
	<p>Target 12.4:</p> <p><i>By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.</i></p> <p>Target 12.8:</p> <p><i>By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.</i></p>

 <p>14 LIFE BELOW WATER</p>	<p>Target 14.1:</p> <p><i>By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.</i></p>
 <p>3 GOOD HEALTH AND WELL-BEING</p>	<p>Target 3.9:</p> <p><i>By 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination.</i></p>
 <p>8 DECENT WORK AND ECONOMIC GROWTH</p>	<p>Target 8.8:</p> <p><i>Protect labour rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment.</i></p>

Additionally, use of some chemicals can pose a barrier to increased material circularity. The UNEP circularity approach builds on value retention loops which seek to maximize the useful lifetime of products, components and materials through the circular economy processes, can have extensive environmental and financial benefits (Figure 1). The opportunity for these processes to add secondary value are typically underpinned by sound design principles, that can enable reduced material use, as well as dismantling and material recovery.

The use of some chemicals can reduce a product's potential for dismantling, material recovery and re-use. For example, avoiding the use of chemical adhesives in the design of building products and electronics can enable further material recovery. Hazardous chemicals in products can also pose a risk for contamination of recycled materials. For example, despite already being banned by the Stockholm Convention on persistent organic pollutants (POPs), certain harmful flame retardant chemicals, likely stemming from waste electronics, have been found in products made from recycled plastic such as toys¹ and other plastic products, like food packaging² and kitchenware³.

Addressing and managing the use of chemicals in products thus plays an important role in transforming the global economy towards patterns of sustainable consumption and production, in the context of achieving the UN's Sustainable Development Goals (SDGs), and aligning with practices outlined in the UNEP Circularity Platform⁴. Following this global momentum, more focus is being seen to be placed upon sustainability of products also at a national and regional level. In the EU, for example, efforts are underway for the development of "Sustainable-by-Design" criteria for chemicals, materials and products⁵.

Chemicals and material ingredients thus are an important factor influencing overall product sustainability and the transition to further use of safer chemicals should be a goal for all manufacturers. Likewise, information related to

¹ International Pollutants Elimination Network, Arnika (2017). [POPs Recycling Contaminates Children's Toys with Toxic Flame Retardants](#)

² Paseiro-Cerrato et al (2020). [Brominated flame retardants \(BFRs\) in contaminated food contact articles: identification using DART-HRMS and GC-MS](#)

³ Samsonek & Puype (2013). [Occurrence of brominated flame retardants in black thermo cups and selected kitchen utensils purchased on the European market](#)

⁴ United Nations Environment Programme (UNEP). [Circularity](#)

⁵ European Commission (2021). [Mapping study for the development of sustainable-by-design criteria](#)

chemicals and material composition should be considered an important part of product sustainability information that is communicated to consumers. Providing such chemicals-related sustainability information is an important factor contributing to sound chemicals management and supporting a shift towards more sustainable consumption and production patterns.

This document explores means and considerations for better providing information on chemicals and material ingredients as part of product sustainability information, by addressing key topics related to chemicals in products. The Guidelines for Providing Product Sustainability Information⁶ has proven to be a useful tool that outlines a framework to strengthen how product sustainability information is provided. In the spirit of a supplement, this document draws upon the Guidelines' 10 high-level principles and discusses them in the context of chemicals in products. Best practice examples targeting providers of information are also offered. Whilst the products explored in this document are highly varied in terms of their materials, components and ingredients, those principles are applicable to all products, to improve the communication on chemicals used.

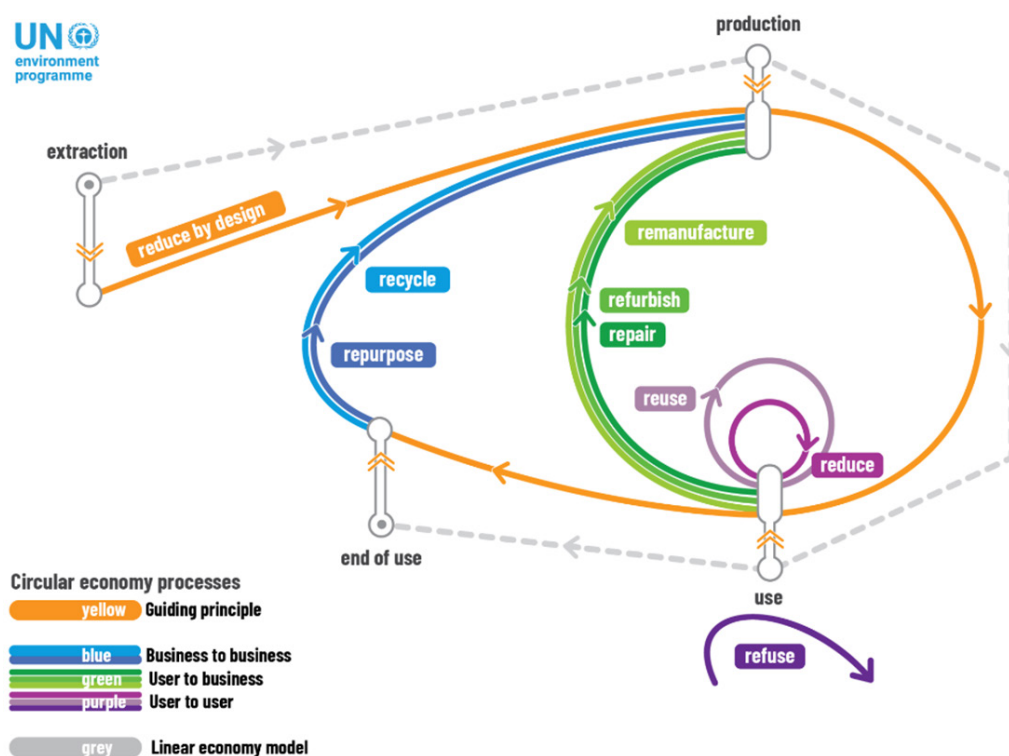


Figure 1 - United Nations Environment Programme (2019). [UNEP Circularity Platform](#).

⁶ The Guidelines for Providing Product Sustainability Information were produced by the United Nations Environment Programme and the International Trade Centre in 2017 as an output of the One Planet network Consumer Information Programme, and hereafter referred to as 'the Guidelines'

IMPROVING SUSTAINABILITY INFORMATION ON CHEMICALS AND INCREASING STAKEHOLDER PARTICIPATION

Through the adoption of the United Nations Environment Assembly (UNEA) resolutions, parties have supported the momentum to promote clearer and more reliable product sustainability information, and called for the involvement of a wide range of stakeholders. Environmental and consumer organizations can play a key role in educating the consumer, and ecolabelling and standardization bodies can help to define, measure and communicate product sustainability. Strong engagement from manufacturers and retailers is also crucial, as they are generally the most direct communicator on product performance, to the largest proportion of end-users.

In some cases, however, market players lack the know-how or internal resources to communicate sustainability effectively. In others, information may be delivered inaccurately or inaccessibly to mask a poorly performing product or to gain a competitive advantage. Besides, chemical and product safety regulations addressing the use of certain substances, as well as required disclosure and labelling, are in place to varying degrees in different regions and sectors. These include, for example, the EU Toy Directive, the Technical Regulation of the Eurasian Economic Union on the Safety of Toys, and the EU RoHS (Restriction of Hazardous Substances) Directive. In the EU, suppliers are required by law to submit information on the use of substances of very high concern (SVHC) in the EU Substances of Concern in Products (SCIP) database⁷.

BOX 1 - THE ROLE OF THE CONSUMER IN CONTRIBUTING TO AN IMPROVED LANDSCAPE ON SUSTAINABILITY INFORMATION RELATED TO CHEMICALS

Consumers play a key role, as their decisions are pivotal in enabling a shift towards more sustainable consumption and production. In this context, the consumer can be an individual, as well as a business or government purchasing, using and/or disposing of a product. Consumers therefore may encompass domestic end-users of good and services, businesses and tradespeople, and professional users and procurers, in both the private and public sector. Consumers can make more informed decisions with effective and accurate communication from the market. Therefore, consumers also play an important role in improving the provision of sustainability information related to chemicals and their demand for clearer and more transparent sustainability claims can stimulate the consideration of chemicals as a key component of product sustainability information. For EU consumers, a series of resources such as apps and template letters are available to facilitate enquiries on the chemical content of products. For procurers, various supporting resources are available to help assess whether a product is more environmentally preferable, including in relation to chemicals. For example, the US EPA have produced Recommendations of Specifications, Standards, and Ecolabels for Federal Purchasing for this audience.

At a smaller scale, consumer choices can encourage manufacturers to improve the sustainability performance of their products. Wider involvement of consumers is key to improving standards of information provision. This can be particularly effective when consumers act as a collective, or are large buyers of materials or products. Specifying information requirements for suppliers as part of procurement tenders can improve the processes of multiple firms who may want to win the contract. At greater scale, consumer demand can help cause a 'tipping point' effect to transform markets, mainstream sustainability for a product type, enable cost-effectiveness of new innovations, and deliver genuine, widespread social and environmental benefits.

Overall, it is suggested for consumer to be discerning the type of information available, and challenge claims made where information is unclear. Examples have been seen where consumer requested further sustainability

⁷ European Chemicals Agency. [SCIP Database: What you need to know](#)

information to companies, resulting in actioned and driven change.

Consumers should use their right to know on chemicals in products. On the latter point however there is not a legal basis to support this in every region. Fewer initiatives to support this currently exist in emerging economies; however, some are being seen that could improve this situation globally. The NGO-led Global Minimum Transparency Standard (GMTS), and the Principles for Chemical Ingredient Disclosure could be used to improve information standards set in the market, and help consumers more easily apply their right to know in emerging economies.

Efforts have also been seen in some sectors to go beyond regulation and business-as-usual practice, where companies have played a leading role in offering more sustainable products that address chemical impacts, putting out a market signal that improvements are possible. For example, in the textiles sector some companies have come together to set out roadmaps and targets for change. Improved sourcing approaches to reduce pesticide use in cotton production, and manufacturing techniques using less hazardous dyes have been introduced. Some actors in the electronics sector have reduced the health and environmental risks from exposure to chemicals such as flame retardants and heavy metals during production and e-waste processing by raising awareness and encouraging action from industry to remove harmful substances, developing ecolabelling schemes, and improving end-of-life re-use and recycling. Promising initiatives that aim to improve the management of chemicals along the supply chains have been seen, but further collective action, innovation and improved communication is needed to mainstream these practices, and enable them to be globally accessible. In particular, there is a severe lack of initiatives that aim to communicate such improvements to individual consumers, who remain largely unaware of chemicals used in the products that they consume.

1.2.1 AUDIENCE OF THE SUPPLEMENT

The primary audience of this supplement is manufacturers and retailers interested in communicating sustainability claims related to chemicals, regardless of the size of the business. These companies will, in some regions, already have to comply with regulatory requirements on restricted chemicals and information displayed, such as hazard labelling on cleaning products, and ingredient lists for cosmetics. However, this supplement seeks to go beyond the cases where regulations govern information related to chemicals and associated claims. It advises on how the market can exercise best practice in providing information on sustainability of their products, related to chemicals and material ingredients.

This is essential to facilitate informed purchasing choices by consumers in relation to sustainability. The guidance in this supplement can be used by companies who may wish to communicate about market-leading sustainability credentials of their products, so these can be effectively differentiated, and the benefits emphasized. It also considers companies selling products achieving a lower level of sustainability performance, but who still want to provide information effectively. In both cases, companies will want to ensure that claims made are accurate, clear and useful to the consumer. In the latter case, an important consideration for the company may be what not to claim, as well as what can be stated, so as not to mislead the consumer.

Improving industry-wide practice in this area also aims to contribute to a more level playing field for the market, by raising awareness on poor practice claims and highlighting good practices. This can increase market confidence and build upon the good work of companies that have made genuine improvements in addressing chemicals of concern, and improved the sustainability performance of their products.

This supplement can be used by sustainability practitioners advising companies, as well as policymakers and regulatory bodies who can apply the guidance to strengthen product sustainability information policies and programmes, and work more effectively with industry. The guidance and recommendations from this supplement may be applicable to products from all sectors, but the main focus, and examples explored, are in relation to chemicals in building materials, electronics, toys and textiles, the sectors covered by the [UNEP Chemicals in Products Programme](#).

1.3

CHEMICALS IN TOYS, TEXTILES, ELECTRONICS AND BUILDING MATERIALS - CHALLENGES FOR THE SECTOR

A wide range of chemicals are encountered in products in the above sectors. This can vary from region to region – product formulations may differ between markets, and may be a function of how developed or significant an industry is, the materials most accessible, and the level of regulation, which varies across the globe.

Some common examples of potential sustainability and health concerns related to these product types are explored below. Many of these have been addressed or considered, at least in part, by a number of governments at national level. This information is non-exhaustive.

Table 2 - Common chemical hazards encountered in building materials, electronics, textiles, and toys

Sector	Example product	Example of hazardous substances that may be contained in products	Associated hazards and possible health impacts
Building materials	Spray foam insulation	Isocyanates	Respiratory conditions ⁸
		Certain halogenated flame retardants such as Hexabromobiphenyl (HBB)	Carcinogen ⁸
	Paints and preservatives	Lead	Neurotoxin, developmental effects ⁹
		Volatile organic compounds (VOC, e.g. benzene, toluene)	Respiratory conditions, carcinogen ⁸
	Carpet	Nonylphenols	Endocrine disruption, extreme aquatic toxicity ⁸
	PVC flooring	Phthalates	Endocrine disruption ⁹
Vinyl chloride monomer (VCM)		Carcinogen ¹⁰	
Electronics	Display screens	Mercury, cadmium	Neurotoxin, developmental effects, kidney damage ⁹
	Cabling	Certain brominated flame retardants	Carcinogen, reproductive health effects ⁹
	Batteries	Lead, cadmium	Neurotoxin, developmental effects, kidney damage ⁹
Textiles	Waterproof materials	Certain Per- and Poly- fluorinated Alkyl Substances (PFAS), e.g. PFOA, PFHxS	Liver damage, thyroid disease, bioaccumulation in the environment ⁹
	Dyed fabrics	Certain azo dyes	Respiratory conditions, skin irritation ¹¹
		Formaldehyde	Respiratory conditions, carcinogen ¹²

⁸ United Nations Environment Programme (UNEP) (2021). [Chemicals of Concern in the Building and Construction Sector](#)

⁹ United Nations Environment Programme (UNEP) (2020). [An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment](#)

¹⁰ International Agency for Research on Cancer (2012). [Chemical Agents and Related Occupations](#). Volume 100 F. A Review of Human Carcinogens

¹¹ European Commission. [Opinion on Risk of cancer caused by textiles and leather goods coloured with azo-dyes expressed at the 7th CSTE plenary meeting, Brussels, 18 January 1999](#)

¹² International Agency for Research on Cancer (2012). [Chemical Agents and Related Occupations](#). Volume 100 F. A Review of Human Carcinogens

	Plastic-based fibres	Nylon, acrylic, polyester	Microfibre release to the environment ¹³
Toys	Soft plastic toys	Certain phthalates	Endocrine disruption ⁹
	Metallic toys (e.g. toy cars, jewellery)	Cadmium, lead	Neurotoxin, developmental effects, kidney damages ⁹

Some of the above chemicals and substances are regulated in different regions. For example, the first laws to phase out lead in paint were enacted in the 1970s, and at the time of writing, [over 44% of countries now have laws on lead paint](#)¹⁴. Regulations may consist of an outright ban of a chemical, or a limit value may be set. However, in the age of global supply chains and export markets, and the ability of consumers to buy a product from all over the world through digital platforms, an end-user may come into contact with a chemical in a product that legally could not be placed on the market in their location. The likelihood of this may also be increased by poor control and enforcement of existing regulations.

Where regulations are in place, and obligations on suppliers are defined, there may be a narrower scope for providing information and making claims. Information provided on the legal limits for a chemical can be useful to educate and engage the consumer, but should not suggest that achieving the minimum legal duty is providing further benefit than is the case.

The situation is more complex when communicating about unregulated chemicals, particularly for those where the evidence of risks and effects is still emerging. In the absence of a framework to refer to, a different approach is required. Sound judgement needs to be exercised in communicating chemicals-related sustainability information where evidence of concern is arising, for example from scientific research, as it may take time before the full picture of the effects are known.

In this case, communications may have to be made with a greater degree of uncertainty, and should always be open and transparent regarding what is not yet fully known. Where a company determines there is a sufficient body of evidence suggesting it is beneficial to remove a chemical from a product – and where regulations do not demand this - a diligent, pragmatic and transparent approach should be taken in communicating how this action improves the product. In this case, the company may be using a substance with another set of effects and unknowns, and should exercise caution in how this is communicated to avoid regrettable substitution.

Exercising the 'precautionary approach as guided by the Rio Declaration¹⁵ on Environment and Development and the UN Global Compact¹⁶ in chemical management is recommended. As a base principle, a company striving for continual improvement within a product sustainability strategy should have checking and review processes, and indicators in place to assess whether changes and substitutions made are contributing to improved overall sustainability performance. An approach of this type should also seek to make safe substitutions in all jurisdictions where this company operates, regardless of the jurisdiction's capacity to verify and control toxic chemicals in products.

Various activities and tools can help companies develop an evidence base on chemicals, form a position, and communicate how sustainable a product is. These include conducting testing, achieving product certifications, and referring to the position of external lists and chemical assessment tools such as the [ChemSec SIN list](#) and the [Pharos Project](#).

¹³ United Nations Environment Programme (UNEP) (2021). [From Pollution to Solution: a global assessment of marine litter and plastic pollution](#)

¹⁴ SAICM Knowledge (2021). [Lead paint law status interactive map](#)

¹⁵ United Nations Environment Programme (UNEP) (1992). [Rio Declaration on Environment and Development](#)

¹⁶ United Nations Global Compact. [The Ten Principles of the UN Global Compact. Principle Seven: Environment](#)

1.3.1 LIFE CYCLE THINKING FOR SUSTAINABILITY ISSUES RELATED TO CHEMICALS

The effects of chemicals on humans, wildlife and the environment may be experienced across the full product or material life cycle. For the product types explored in this supplement, examples of these effects are presented below (this list is non-exhaustive).

Table 3 - Concerns associated with chemicals across the product life cycle

Product	Raw material extraction	Production	Installation	In-use	End-of-life
Building materials	Metals Acid mine drainage from metal extraction ¹⁷	Paints Exposure to organic solvents ¹⁸	Spray foam insulation Exposure of installers to isocyanates in spray foam insulation ¹⁹	Wood panels Occupant exposure to formaldehyde ²⁰	PVC flooring Dioxin release from incineration of waste PVC ²¹
Textiles	Cotton Use of certain pesticides in cotton growing ²²	Dyed clothing Health effects from exposure to Azo dyes ²³	Carpet Off-gassing of VOCs from new carpet installations ²⁴	Polyester clothing Microfibre release from washing ²⁵	Waterproof clothing Release of PFAS into the environment ²⁶

¹⁷ Science Direct. [Acid Mine Drainage – an overview](#)

¹⁸ Aida Abd El Hamid Hassan, et al (2013). [Health Hazards of Solvents Exposure among Workers in Paint Industry](#)

¹⁹ Rother and Schlüter (2021). [Occupational Exposure to Diisocyanates in the European Union](#)

²⁰ Agency for Toxic Substances and Disease Registry. [Formaldehyde in Your Home: What you need to know](#)

²¹ Thornton (2002). [Environmental Impacts of Polyvinyl Chloride Building Materials](#)

²² Memon et al (2019). [Health problems from pesticide exposure and personal protective measures among women cotton workers in southern Pakistan](#)

²³ Scott and Moore (2000). [Assessment of the risks to human health posed by azo colourants in toys, writing inks and paper products, and analysis of the advantages and drawbacks of restrictions on their marketing and use](#)

²⁴ United States Environmental Protection Agency (2022). [Volatile Organic Compounds' Impact on Indoor Air Quality](#)

²⁵ De Falco et al (2019). [The contribution of washing processes of synthetic clothes to microplastic pollution](#)

²⁶ Glüge et al (2020). [An overview of the uses of per- and polyfluoroalkyl substances \(PFAS\)](#)

Product	Raw material extraction	Production	Installation	In-use	End-of-life
Electronics	Metals Release of heavy metals (e.g. mercury) from mining ²⁷	Circuit board components Use of hexavalent chromium to manufacture circuit board components ²⁸	Cabling Exposure to phthalates from long-term use and handling of PVC cabling ²⁹	Computers Exposure of users to hazardous flame retardants in dust ³⁰	E-waste Exposure to heavy metals and hazardous flame retardants ^{31 32}
Toys	Petrochemical extraction Worker exposure to hydrocarbon gases ³³	PVC toys Exposure of production workers to vinyl chloride monomer ³⁴	Wood treatment Heavy metal release to soil from outdoor play equipment ³⁵	Children's jewellery Exposure of users to heavy metals in children's jewellery ³⁶	PVC toys Entry of phthalates into the environment from disposal ³¹

²⁷ Esdaile and Chalker (2018). [The Mercury Problem in Artisanal and Small-Scale Gold Mining](#)

²⁸ El Safty et al (2014). [Occupational Health Hazards among Double Sided Printed Circuit Board Manufacturers](#)

²⁹ Pecht et al (2018). [Phthalates in Electronics: The Risks and the Alternatives](#)

³⁰ Zeng et al (2020). [Brominated flame retardants in home dust and its contribution to brominated flame retardants bioaccumulation in children hair](#)

³¹ World Health Organization (2021). [Soaring e-waste affects the health of millions of children, WHO warns](#)

³² IPEN (2019). [Highest Level of World's Most Toxic Chemicals Found in African Free-Range Eggs: European E-Waste Dumping a Contributor](#)

³³ Paz-y-Miño et al (2008). [Monitoring of DNA damage in individuals exposed to petroleum hydrocarbons in Ecuador](#)

³⁴ International Agency for Research on Cancer (IARC) Monographs (2018). [Vinyl Chloride](#)

³⁵ European Commission (1998). [Scientific Committee on Toxicity, Ecotoxicity and the Environment \(CSTEE\)](#)

³⁶ Cui et al (2015). [Toxic metals in children's toys and jewelry: Coupling bioaccessibility with risk assessment](#)

2

COMMUNICATING PRODUCT SUSTAINABILITY INFORMATION RELATED TO CHEMICALS: ALIGNING WITH THE GUIDELINES FOR PROVIDING PRODUCT SUSTAINABILITY INFORMATION

This section explores examples of product sustainability claims related to chemicals, whether in a marketing claim or communication aimed at the consumer or at another actor (such as another business) in the supply chain, for the four product groups profiled. The Guidelines set out ten principles that can form the basis for this: five fundamental and five aspirational.

Examples are provided of how each principle can support the communication of sustainability information related to chemicals, as well as examples where a claim should be improved to not mislead consumers.

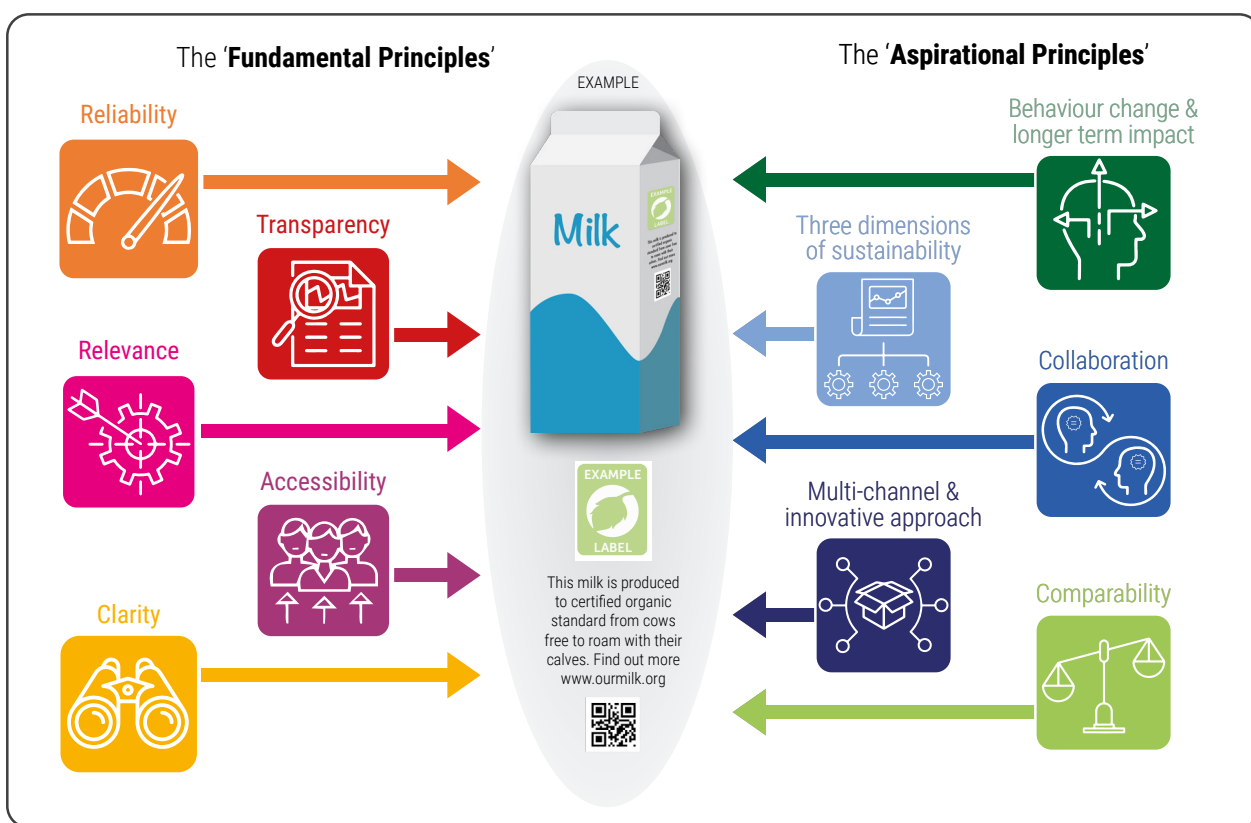


Figure 2: Fundamental and Aspirational Principles for providing Product Sustainability Information

2.1 FUNDAMENTAL PRINCIPLES

The fundamental principles establish the most important criteria to be met when providing product sustainability information to consumers. Where relevant, a claim should demonstrate all these principles, and statements made should not contravene any of these principles.

RELIABILITY



Build your claims on a reliable basis

- Accurate and scientifically true.
- Robust and consistent.
- Substantiated data and assumptions.

Sustainability claims must be accurate, truthful and substantiated. Information provision on chemical content is more effective when backed up with robust evidence and data. Where regulations related to chemicals are in place for products, suppliers have to adhere to defined standards and test methods to demonstrate conformity. Beyond regulatory requirements, a company may wish to demonstrate the degree to which their product is market leading. To achieve this in a reliable way, figures quoted should be clearly linked to the relevant industry standard, as well as the source of the test data.

Regulations on chemical content are not in place in all regions, but conformity and performance against ISO or other international or domestic, consensus-based standards can still be demonstrated on a voluntary basis. For example, the formaldehyde content used in synthetic materials in various products can be tested for and demonstrated using the standards shown in Table 4.

Table 4: Test methods for analysis of formaldehyde content

Product type	Standard
Textiles	ISO 14184 – Textiles. Determination of formaldehyde. Free and hydrolyzed formaldehyde.
Building products	EN 717-1 – Wood-based panels. Determination of formaldehyde release. Formaldehyde emission by the chamber method.
Toys	EN 71-11 Methods of Organic Chemical Compounds Analysis in Toys.

The source of test data should be clearly identified. Consumers may be unfamiliar with how products are tested, and if no information is provided on the source of data, it may be assumed that testing has been done by a third party, when the claim may actually be a manufacturer's self-declaration. Manufacturer's own testing can provide a reliable evidence base, provided staff carrying out tests are competent and the necessary quality management procedures are in place. However, credibility can be added to a company's own testing by obtaining peer-review or verification from a competent external body. The most robust option is to provide testing from independent, accredited, third-party facilities.

The competence, quality control and processes used by test laboratories and ecolabels should also be considered by companies using these means to back up sustainability claims, as this may vary. Accreditation against standards

such as ISO 17025³⁷ and ISO 17065³⁸ can provide assurance that conformity assessment bodies used to substantiate claims are competent and generate accurate results. Further guidance on this selecting appropriate testing laboratories and ecolabelling schemes can be found from the US National Institute of Science and Technology³⁹ and US Environment Protection Agency⁴⁰.

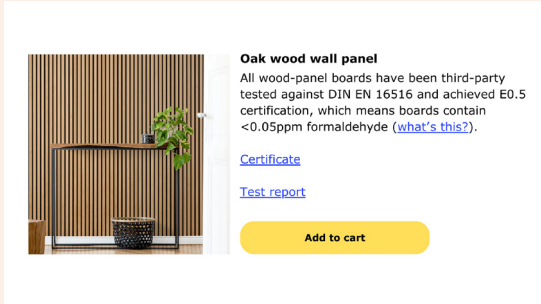
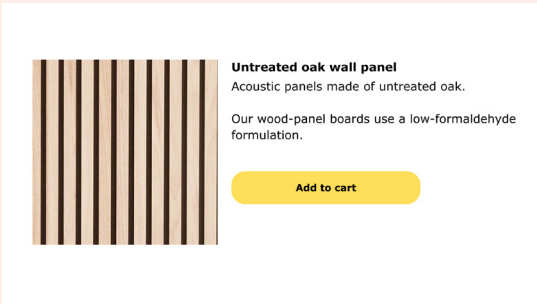
Information provided should be suitable and understandable for the audience. A domestic consumer may wish to know some information about the content of a particular chemical in a product, and that it has been tested according to the relevant protocols, but may not understand more detailed, technical information. A professional procurer may require more detailed information to check the product meets standards defined for a project, or public sector sustainable procurement criteria.

³⁷ ISO. [ISO/IEC 17025 Testing and calibration laboratories](#)

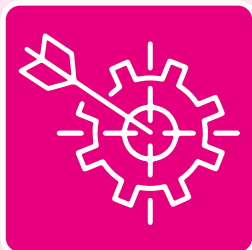
³⁸ ISO. [ISO/IEC 17065:2012 Conformity assessment – Requirements for bodies certifying products, processes and services](#)

³⁹ National Institute of Standards and Technology (NIST) (2018). [ABC's of Conformity Assessment](#)

⁴⁰ United States Environmental Protection Agency (2023). [Framework for the Assessment of Environmental Performance Standards and Ecolabels for Federal Purchasing](#)

Product: Wood-panel boards	Do (company A)	Don't (company B)
Claim	 <p>Oak wood wall panel All wood-panel boards have been third-party tested against DIN EN 16516 and achieved E0.5 certification, which means boards contain <0.05ppm formaldehyde (what's this?). Certificate Test report Add to cart</p>	 <p>Untreated oak wall panel Acoustic panels made of untreated oak. Our wood-panel boards use a low-formaldehyde formulation. Add to cart</p>
Discussion	<ul style="list-style-type: none"> The claim demonstrates achieving E0.5 certification, and references the standard that the product has been tested against. This enables traceability of the claim and demonstrates it is consistent with how the industry performs tests. Even if they are not familiar with the standard, the consumer can look this up for further background. Provision of a link to the test house's certificate and report further reinforce the claim. All the information provided may not be fully understood by the end-user. By including a 'what's this?' link, further information can be provided to educate the consumer about formaldehyde, its pathways of release, and effects, and how the company has aimed to reduce the levels in this product. Resources quoted can come from an independent body, such as to the California Air Resources Board (CARB), who administer the US formaldehyde regulations and provide this independent fact sheet on Formaldehyde. 	<ul style="list-style-type: none"> Formaldehyde limits are in place in some regions (USA, EU, Japan, China), but not all. Even where regulation applies, cases have been seen of wood-based interior building materials not meeting mandatory formaldehyde limits. Providing a substantiated claim can provide greater assurance to the consumer that the product performs as it claims. If there is not a robust basis for quantification of the levels of a chemical in a product that enables comparison against other products on the market, it is not recommended to claim that a product contains low levels of a chemical. In this case, it is better to not make a claim.

RELEVANCE



Talk about major improvements, in areas that matter

- Significant aspects ('hotspots') covered.
- Not masking poor product performance, no burden shifting.
- Genuine benefits which goes beyond legal compliance.

As consumers may not always be familiar with chemicals used in products and their environmental impacts, it is essential that information provided by the market refers to the most important and significant impacts. Referring to only a single issue or one with lower importance can take the focus away from the main hotspots and mislead the consumer.

Additionally, consumers are often not familiar with legislation or what limits for chemicals mean in practice. It is poor practice to suggest that a product that only achieves the minimum regulatory requirements or does not contain an already banned substance, is performing better than it really is.

Product: Paint	Do (company A)	Don't (company B)
Claim		
Discussion	<ul style="list-style-type: none"> • The claim places a focus on the reduced levels of volatile organic compounds (VOCs), an important sustainability aspect for paints. • Achieving and communicating a certification, such as the Nordic Ecolabel for paints, also demonstrates the wider-ranging environmental and health benefits of the product, and that they go beyond minimum legal limits. • The link to the certification and key sustainability aspects of paints enables the consumer to find out more information. • The information provided is comprehensive, and enables the consumer to understand important sustainability considerations for paint. By linking to external data sources, this also does not overwhelm the user with too much information. 	<ul style="list-style-type: none"> • 'VOC compliant' suggests an environmental benefit, and some users may interpret this as being the same as 'low-VOC'. However, no quantification of the figure, or comparison with regulatory limits or market averages is mentioned. • Where VOC limits are in place, achieving compliance only means that the minimum legal limits are achieved. The claim and accompanying mark suggest a benefit beyond this. • Other aspects of the product, including the presence of any substances of concern (such as heavy metals, or chemicals in some biocides or anti-skinning agents) are not discussed as part of the product listing.

CLARITY

**Make the information useful for the consumer**

- Exclusive and direct link between claim and product.
- Explicit and easy to understand.
- Limits of claim clearly stated.

Sustainability claims should be specific and not vague. The Guidelines list several terms often seen to describe products that have no agreed or universal definition. These terms do not convey understandable or tangible benefits, and can be both confusing and inaccurate for the consumer. Some of these commonly-used terms are detailed in Box 1.

When communicating a perceived benefit from reduction or removal of a chemical, the limits of the claim should be explicit. It is best practice to identify substances contained and their amounts, compared to the limits in legislation, market averages or specified by a certification scheme.



Where a certification is held, it is recommended to provide further details on what this means, and the limits of what is covered by the certification. Consumers often are not familiar with the range of aspects addressed by certification schemes. Again, this needs to be clear and compliant – often the certification body will have defined guidelines on what can be communicated and how. It is important to ensure that a direct link is made between products and the claims made - does the claim apply to all products sold by the company, a particular line or range, or only certain products?

In some cases, a certification body will issue a document identifying the scope of the certification, and the test methods and standards used or met. Some certification programmes give specific guidance on how marks can be used, and a good sustainability claim should accurately adhere to this guidance.

The terms in Table 5 are considered to be broad in their description and difficult to accurately define and substantiate. It is recommended that the use of these are avoided in sustainability claims and information provided, including when applied to chemicals in products. This list is not exhaustive.

Table 5: General sustainability benefit claims recommended to be avoided

Claim	Discussion – how could the claim be made better?
“Environmentally friendly” or “Eco-friendly”	<ul style="list-style-type: none"> • These terms are very broad and, as such, are providing no specific reference to a performance attribute or impact mitigated. • A better approach in the context of chemicals would be to identify which chemical is used in this product type, how it enters the environment and what is known about its effects. • An evidence base should be provided for why the product in question can reduce this impact, drawing on recognized standards, a certification or robust test data.
“Natural” or “Organic”	<ul style="list-style-type: none"> • The terms “natural” or “organic” are often used to describe non-synthetic materials – often the terms are applied to materials such as bamboo, sisal and in the case of organic, cotton. However, these materials are not necessarily safer and may contain chemical additives – transparency on the presence of additive substances is essential, if these could be harmful. • A claim of “organic” should be backed up with evidence or a certification, such as the Global Organic Textile Standard (GOTS), or the US Department of Agriculture Organic certification. Declaring that a material is organic without further information to substantiate this does not create confidence that the claim is accurate, or confirm that the sourcing process is transparent. • The term “organic” has also been seen to describe products that are organic compounds, i.e. carbon containing, and are not accurately describing a sustainable feature. This is misleading, as the common use of the term is in relation to avoided pesticide use, and is not being applied in this context. • A better approach is to identify clearly what the material used is, if it is a composite material, and not use the term “natural” without further detail. More information should be provided on additives, if any are used, identifying any potentially harmful ones. This could be done through testing or a certification. • Additional information on the company website could be linked to, educating the consumer on what these materials are and where they come from. • Additionally, responsible sourcing aspects for these materials should also be in place, and where relevant, reported to ensure the claim is not burden shifting and diverting attention away from another issue.
“Non-toxic”, “Ecologically safe” or “Pollutant free”	<ul style="list-style-type: none"> • These terms are typically used to describe chemical content, but may be misleading if substances or toxicity metrics are not mentioned. • A better approach would be to detail substances contained, and their levels against industry standard values or regulatory limits. This could also be achieved and substantiated through a certification that specifies lower levels, or removal of a substance. • A “pollutant-free” claim suggests a chemical has been removed or substituted, but this should not be the only information provided – better practice would be to include information about how a substance has been removed without affecting product performance, or how an identified substitute chemical improves the overall sustainability of the product. • “Pollutant-free” may imply that the product has been made safer in terms of chemical release in the in-use or end of life phase. Without being more specific on the pollutant removed and the life cycle stage it typically is released at, this may be burden shifting from another stage, e.g. production.

Product: Apparel	Do (company A)	Don't (company B)
Claim	 <p data-bbox="336 602 852 707">Our clothing has been tested and certified to the OEKOTEX 100 standard and contains no azo dyes. Read our test report here.</p>	 <p data-bbox="919 602 1425 674">Reduce your environmental impact with our natural range of eco-friendly fabrics.</p>
Discussion	<ul data-bbox="320 763 863 1267" style="list-style-type: none"> • The OEKOTEX standard is included as the basis of the claim and links to details of specific substances the product is free from. • Details of the standard achieved are linked to – customers can look up the substances in question and limit values. • Including the test report provides further assurance to the customer and provides further details of the limit of the claim. • Individual products included within the certification can be identified. 	<ul data-bbox="896 763 1430 1234" style="list-style-type: none"> • More general terminology such as 'natural' or 'eco-friendly' is unsubstantiated. • Information is not provided on what the material composition of the fabric is, and whether all components are 'natural'. • The claim is not specific to the product in question – it is not clear if the 'natural range' applies to all products. • No specific information is included on chemicals used or substituted in the product.

TRANSPARENCY



Satisfy the consumer's appetite for information, and do not hide

- Developer of claim and provider of evidence published.
- Traceability and generation of claim (methods, sources, etc.) published.
- Confidential information open to competent bodies.

Sustainability claims for products related to chemicals may have an evidence base behind them, but this information is not always made available. In some cases, companies may have confidentiality concerns, or may not see the benefit of providing further detail or background. In other cases, manufacturers may choose not to disclose products' chemical ingredients where they are not required to by regulations.

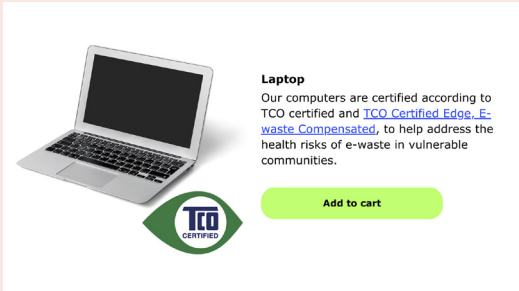
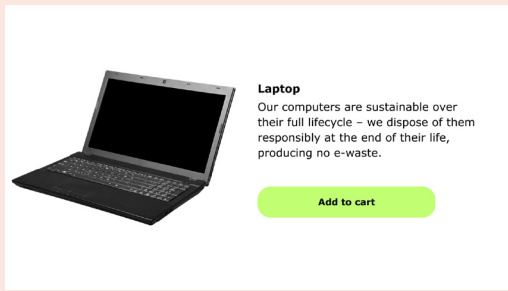
However, it is best practice that the consumer has the "right to know" about the presence of chemicals and their toxicity.

Furthermore, a sustainability claim related to chemicals should not be accompanied by opaque or incomplete information. For example:

- Testing commissioned should include details of who conducted the testing, and how (e.g. standards or a description of the method).
- Where a comparison against other products is made, the rationale and assumptions behind this should be clearly stated.
- If the claim draws on the assessment of an expert, this should include details of who provided the input, their competency and the methodology used.
- Communicating that a certification has been gained can go beyond only reporting the outcome. Information can be provided to the consumer on why the particular scheme was chosen and what it covers. Some certifications use a scoring system or a "gold, silver, bronze" rating – in these cases, a transparent claim can also include if the company will aim to achieve a higher rating in future or if there were any areas for improvement identified that the company will continue to work on.
- In case uncertainty arises during the development of chemical-related claims, companies should seek further information, for example from their upstream suppliers or expert consultants.

Consumers may desire different levels of information on environmental or health aspects of products. Information provided should satisfy this - which may enable a comparison with another product, or provide base level information on pathways of exposure to hazardous chemicals in a product, including through different usage patterns.

Additionally, transparency of processes and procedures for how companies manufacture, source, install and dispose of products is a key pillar of best practice information provision. Whilst this may not always be included in detail at the point of sale, this can still be provided in other forms, such as on the company website. Information provided can include evidence of due diligence such as audit reports and certifications, and supplemented in the form of narratives, case studies and testimonials.

Product: Laptop	Do (company A)	Don't (company B)
Claim		
Discussion	<ul style="list-style-type: none"> Using TCO Certified provides a recognized means of assurance that substances typically found in electronics have been tested by independent toxicologists, and approved as safer. The products also meet the TCO Certified Edge criteria for e-waste, with the latest version of the standard linked to. This provides full transparency of what the certification includes, and a list of the approved collectors used for responsible end-of-life processing. 	<ul style="list-style-type: none"> Transparency is lacking in the above claim on the end-of-life process. Many routes exist for end-of-life treatment and disposal, but many of these are not audited to ensure that substances, such as flame retardants in circuit boards within the computer do not cause harm to operatives. No specific detail is provided on the chemical and environmental impact of the components used and assembly of the computers. Claims of sustainable sourcing should be backed up by procedures and details of audit programmes, covering health and environmental impacts of material sourcing and factory production. No information has been provided on who has assessed whether the computer disposal has been conducted responsibly, or how far along the supply chain this information was obtained from.

ACCESSIBILITY



Let the information get to the consumer, not the other way around

- Clearly visible: claim easily found.
- Readily accessible: claim close to the product, and at required time and location.

Product listings or marketing materials may only provide limited information on the chemicals contained in products, or the safety and environmental standards met. In some cases, information is available, but only in hard-to-find places on websites, in the 'small print', or only available 'on-request'.

Consumer awareness of chemicals issues is increasing, and more engaged consumers may want more comprehensive information about the chemical ingredients of products. Others may only wish to access limited information to enable a basic understanding of key safety and sustainability issues, assurance that the product meets standards, or does not contain a particular chemical. Often, consumers may make very quick assessments on whether to purchase a product, and if sustainability information is not easily available, they may not incorporate this into their decision.

The EU's REACH regulations include provision that the consumer has the 'Right to Know' about substances of very high concern (SVHC) contained in products, although the means for providing this information is the prerogative of the manufacturer. In practice, this information is provided with varying degrees of accessibility.

Some product-related claims contain very little information, either directly at the point of sale or through other information channels provided. For online sales, evidence has shown that in some cases, the information provided to consumers is very low – for example, a 2020 report⁴¹ by HEJ Support found that information provided online for textile products usually only includes washing and care instructions. It is recommended that online sustainability information is provided in close proximity to the product, as well as in other places on the website, and should be easy to navigate and find. Beyond only making available supplementary information, effective linking, tagging and filtering functions on websites can make resources more accessible.

For in-store purchases, the product packaging alone may not be able to provide as much information as is desired. This can be supplemented by providing further information through displays at the point of sale, or linked to through scannable QR codes. Some consumers are not as familiar with digital tools as others; an important part of making information accessible is considering the needs and information channels used by different people. Printed brochures and leaflets at an in-store point of sale may be the preferred route of information provision for some consumers.

As a principal base practice, it should be ensured that companies have considered the full range of communication methods that may be needed to inform people who may use or be exposed to chemicals in their products. For example, companies should consider if essential information is accessible for people using different languages and alphabets, with varying levels of education and literacy, or with visual or hearing impairments.

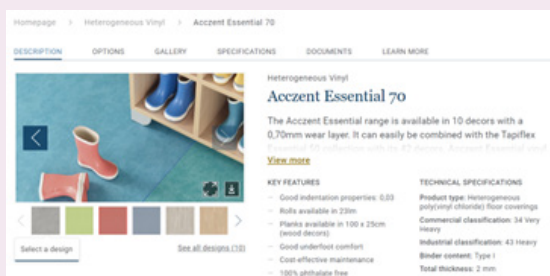
The Globally Harmonized System of Classification and Labelling of Chemicals (GHS), was first adopted in 2002 and provides a framework to enable more consistent communication and identification of chemicals across global markets. The GHS proposes a harmonized classification system (covering physical, health and environmental hazards) and communication system, covering symbols, labels and safety data sheets. This helps address transparency challenges as part of sound chemical management by providing easily identified pictograms on

⁴¹ Speranskaya and Caterbow (2020). [Sustainable Fashion? How companies provide sustainability information to consumers](#)

products. Full implementation of the GHS has been recommended, as it specifically contributes to objectives of the SAICM Global Plan of Action (risk reduction; strengthening knowledge and information sharing; governance: strengthening of institutions, law and policy; capacity building). However, wider global implementation remains in progress.

Best practice examples of accessibility include where information provided is comprehensive, well-organized, and in convenient proximity to product listings. Digital tools used effectively connect the consumer with the information they need, without providing excessive, overwhelming amounts that could cause confusion.

Product: PVC flooring - Do (company A)



- Easily accessible headings are used to help the consumer find sustainability information. Beyond information on product features, key documents that provide further sustainability information and a 'learn more' tab enable further information to be easily found by the consumer.

Accent Essential 70

DESCRIPTION OPTIONS GALLERY **SPECIFICATIONS** DOCUMENTS LEARN MORE

Sustainability performances

	Norm	Tarkett value
Recyclability through ReStart®	-	Recyclable
ReStart® Ready	-	Yes
Material Health Statement	-	Available
SCS Floorscore	-	Yes
French emissions label	-	A+
Recycled content	-	32 %
Phthalate - free	-	Yes
Total VOC Emissions	EN 15516	Platinum (< 10 µg/m³)
Formaldehyde emission class	EN 717-1	E1
Made in	-	Europe

- The specifications tab includes easily accessible information on chemical aspects such as the levels of volatile organic compounds (VOCs), quoting a standard.
- This section also makes the consumer aware that a Material Health Statement (MHS) is available for the product, which is easily found in the documents section.

MHS[®]
MATERIAL HEALTH STATEMENT

ACCENT

Issued to: **TARKETT**

Product specifications: **ACCENT**
Unit, Essential 3/63, Essential 4/70, Excellence 3/63, Excellence 4/80, Excellence Genius 3/63, Excellence Genius 4/70, Platinum 3/90, Platinum 4/100, Topaz 70, Ruby 70, Classic 40, Asteror 70, Asteror 55, MultiUse Aqua

Issue date: December 04., 2020. Reprint September 31., 2021

Expiration date: December 03., 2022

Evaluation threshold: At least 100 µgm of the final product

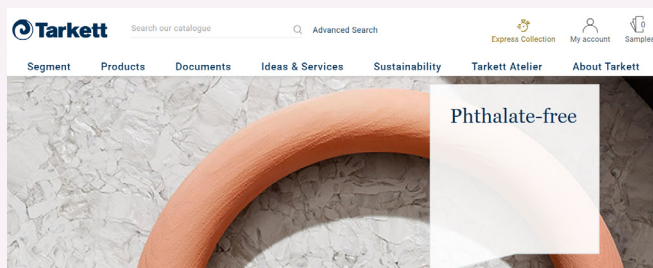
After-use scenario: [TARKETT ReStart® Program](#)

EPEA Registry No: 39941.2

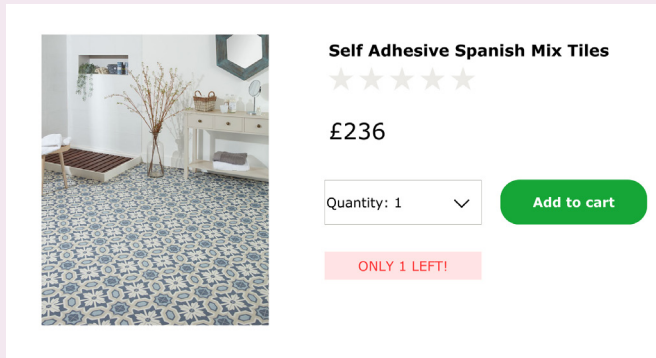
MHS Version: 2.0

FUNCTION	CHEMICAL	CLAS	APPROX. CONCENT.	EPEA RISK	COMMENT	RELT. RISK	REMARKS
PVC*		REG.61.2	<10%		Transitional use of PVC is tolerated in durable applications designed with good environmental and chemical resistance to follow a plan in certified products. These products will have your installation, maintain and plan to prepare to take back your products after use.	1/25	✓
Phthalate							

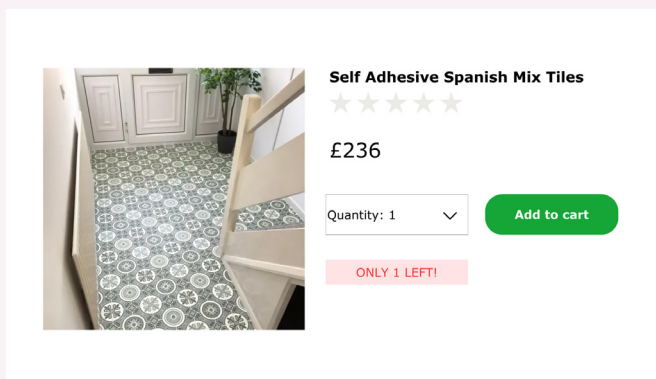
- The MHS provides comprehensive information on the materials and chemical ingredients used in the product.
- Additionally, the MHS links to details of the company's take-back programme, enabling end-of-life recycling, which in the case of PVC flooring has environmental, safety and circularity benefits compared to other disposal methods such as landfill or incineration.



- The claim of "phthalate-free" is made in several product listings and further information about this is easily accessible. The MHS gives details of the PVC plasticizer used to replace phthalates.
- Pages in the sustainability section cover the topic, giving the consumer more information about phthalates in general, as well as the company's journey in addressing this issue.

Product: PVC flooring - Don't (Company B)


- In online listings, information in proximity to the price is the most prominent and accessible place. However in this case, the opportunity to provide or link to easy-to-find sustainability information or product specification data is not taken.
- Even if there is not space to provide detailed information, placing links or tabs to sustainability information can make it more accessible to the consumer.



- The product listing does provide information further down the page, but this is not organized by topic – sustainability information is provided alongside general product features.
- Safety data sheets (SDS) are a key source of information on chemical ingredients and how certain conditions (for example, in the event of fire) affect the product. Making this information easily accessible is best practice to inform the consumer. In this context, the consumer may be a large-scale procurer (e.g. in a commercial or public sector capacity) who may require this information for achieving sustainable procurement criteria, building risk assessments, or in relation to insurance.
- The product claims that 'harmful additives' have been removed but does not make accessible any information on what the replacement is, or how this results in an improvement.
- Additionally, generic and unsubstantiated language has been used, without accessible further evidence to back this up.

2.2 ASPIRATIONAL PRINCIPLES

Beyond the fundamental principles, five aspirational principles are outlined in the Guidelines. Use of these in sustainability claims and information provision can build on the essential attributes for claims and provide a set of information that is highly comprehensive, useful and engaging for the consumer. In the case of chemicals in products, information to be communicated may be technical and complex. As some consumers may have a low level of understanding of the effects, exposure pathways, and similarities of different chemicals and their regulatory landscape, regular use of these principles alongside the fundamental ones is highly recommended.

THREE DIMENSIONS OF SUSTAINABILITY



Show the complete picture of product sustainability

- Environmental, social, and economic dimensions considered.
- Burden shifting between the dimensions avoided.
- Complementary certification schemes combined.

A product cannot be deemed sustainable if it does not address social and economic impacts of the various life cycle stages alongside environmental ones. Upstream impacts of extraction and production may be less visible to the consumer than the impacts seen from use or disposal of the product. Chemicals used in material extraction and production can cause detrimental social and economic aspects to communities near where these activities take place. Typically, lower-income or vulnerable communities are disproportionately affected, as they may be in closer proximity to extraction, production and disposal activities. Examples of this have been seen from pesticide use⁴², plastic pollution⁴³ and petrochemical manufacturing⁴⁴ in both emerging and developed economies.

Various studies suggest consumers are becoming more aware of where their products come from, and in some cases are prepared to pay more for a product demonstrating higher standards in ethical sourcing. A [study reported in Forbes](#) which polled 25,000 participants worldwide concluded that consumers on the whole are engaged with this topic, and that companies should be more transparent in their sourcing processes.

It is prudent for supply chain actors and the supplier of the final product to provide as much information as possible on chemical impacts of products. This information can be essential to companies downstream in the supply chain, and enables the end consumer to be better informed. Where complex supply chains are involved, it can be difficult to maintain full transparency on all aspects. A company may know everything about the manufacturing process and ingredients used in a product, but not the conditions or labour rights for workers at each stage of the process. In this instance, it is important to not suggest that an improvement in a material used, or the product's performance, are a proxy for the full sustainability picture. With the increased focus seen on ethical sourcing, more downstream manufacturers and retailers are wanting to address their knowledge gaps in the social and economic impacts of production, alongside assurance on chemical ingredients in the final product.

Claims made on each of the three dimensions should be specific to these areas, and not mask poor practices or unknowns in other areas. When attempting to substantiate and communicate good practices across all three dimensions, it may be useful to draw on specialists or dedicated support resources for each. Some certification

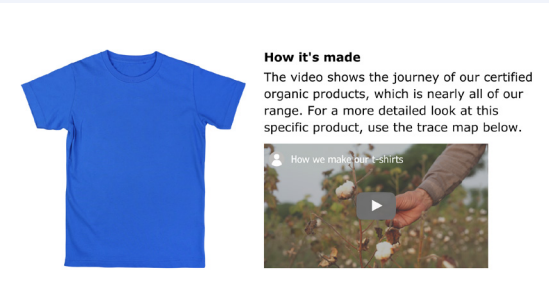
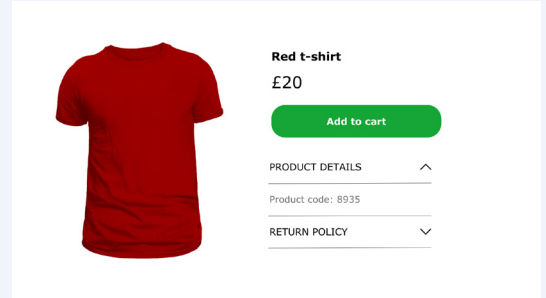
⁴² European Union (2021). [The use of pesticides in developing countries and their impact on health and the right to food](#)

⁴³ UN News (2021). [Plastic pollution disproportionately hitting marginalized groups, UN environment report finds](#)

⁴⁴ UN News (2021). [Environmental racism in Louisiana's 'Cancer Alley', must end, say UN human rights experts](#)

schemes do cover a range of aspects – for example, various metals and minerals schemes draw on the multi-dimensional and life cycle-based criteria laid out by the [Responsible Minerals Initiative](#) (RMI) Risk Readiness Assessment. These cover social and economic aspects related to chemical use, from working conditions and quarry management, to biodiversity aspects and site emissions.

However, in other cases it may be necessary to combine different means of assessment. For example, a plasterboard company may wish to demonstrate that the product does not contain certain chemicals through laboratory testing, alongside a publicly reported audit process of chemical safety practices in factories making the product.

Product: Apparel	Do (company A)	Don't (company B)
<p>Claim</p>	 <p>The video shows the journey of our certified organic products, which is nearly all of our range. For a more detailed look at this specific product, use the trace map below.</p>	 <p>“Responsibly sourced cotton/polyester blend t-shirt”</p>
<p>Discussion</p>	<ul style="list-style-type: none"> The clothing supplier includes sustainability claims and information provision on its website that addresses the environmental, social, and economic dimensions of sustainability. Alongside key product information, further narrative is provided and accessible in prominent places on the website - product listings include a video explaining how t-shirts are made, and a mapping tool to show the geographical scope of the supply chain, to further engage the consumer on this issue. Beyond information on factory selection and auditing, a certification is used to demonstrate avoided pesticide use in cotton growing. 	<ul style="list-style-type: none"> The claim of “responsibly sourced” suggests that the product has addressed concerns related to labour rights or raw material management, but is not further substantiated, and terminology used is vague. No detail is provided on chemicals used or avoided in the manufacture of the product. This claim could be an example of ‘burden-shifting’ – the implication that social or economic aspects have been addressed may be diverting attention from poor practices in chemical use that have impacts in manufacture, use and at end-of-life.

BOX 2 - INITIATIVES IMPROVING TRANSPARENCY ON ENVIRONMENTAL, SOCIAL, ECONOMIC AND GOVERNANCE ISSUES

Transparency of the full range of impacts of a product (which are explored as part of the section on life cycle thinking in chapter 2) is a key component of sustainability. Various strategies and initiatives are being seen to improve transparency and reduce unknowns related to chemicals in the supply chain. This can feed into improved information provision in the supply chain and to the end consumer.

Issues such as e-waste and responsible sourcing of materials have seen increased focus in recent years. Initiatives such as the [Global Battery Alliance](#) seek to improve this through various action programmes. The [Critical Minerals Advisory Group \(CMAG\)](#) aims to improve transparency in the supply chain and set standards, with the intention of eliminating child labour. The [Battery Passport](#) aims to provide information about batteries and their components over the entire life cycle, from material extraction, to the end of first life, and into subsequent life cycles. This aims to improve the process of supply chain mapping for manufacturers and downstream retailers, and create greater transparency in the practices and impacts of batteries. This seeks to enable more responsible material extraction, longer lifetimes, improved circularity of components, and safer waste management.

A similar ethos of using digital passports has been proposed for building materials, which could also enable tracking to manage risk (including related risks to chemicals) and improve transparency in this value chain. Early examples of this could work have been seen from [Madaster](#) and [Orms](#).

At the current time, many companies will still have to deal with a degree of uncertainty in this area, due to the complexity of supply chains. Good sustainability claims in relation to this issue should not imply that more safeguards are in place than is actually the case.

BEHAVIOUR CHANGE AND LONGER TERM IMPACTS



Help move from information to action

- Insights from behavioural science applied.
- Consumers actively encouraged to play a role, where appropriate.
- Longer-term relationship built with consumer.

Only engaging the consumer on sustainability on one-off or occasional purchases does not deliver as much benefit as influencing longer term purchasing habits and behaviours. In many cases, impacts are connected to not only how products are made, but how consumers use them.

Best-practice communications seek to engage the consumer beyond just the initial purchase. This can enable better understanding of the wider issues related to products over the full life cycle, 'nudge' them towards more sustainable choices in future, and encourage consideration of further actions beyond buying the product.

In the context of chemicals in products, this may lead to improved education on substances used, and means for finding a lower-impact alternative. Consumers may also be encouraged to extend the life of their products or dispose of them more carefully, to mitigate end-of-life impacts of chemicals, and enable better material recovery.

Behaviour Change and Longer-Term Impact - Case study: Fairphone

A pioneering company in the field of sustainable electronics, Fairphone has received attention for the circular design of its mobile phones and its practices for responsible sourcing of critical raw materials. However, its communications, strong consumer engagement and business model are also key aspects of its efforts to drive sustainability improvements in the mobile phone industry.

Fairphone's approach seeks to normalize the concept that a mobile phone can have a longer ownership cycle than is typically seen (worldwide, this is around 33 months⁴⁵). A longer ownership term and end-of-life processes that encourage greater material recovery can reduce the impacts of raw material extraction and e-waste processing, including in relation to chemicals. The company's approach seeks to embed these considerations in longer-term consumer habits, so as to influence the consumer to choose products in future that consider these aspects, and avoid products where this is not addressed.

Increasing the product life cycle and improving circularity

A primary focus of Fairphone is to address the issue of circularity. Key features of its phone and business model are its modular design and long warranty, but in addition its encouragement of consumers to be involved in the dismantling and repair process creates greater engagement with the issue.

The company communicates that no part of its Fairphone 4 is glued shut, so that consumers can use a standard screwdriver to dismantle it and source replacement parts. This approach to using mechanical connections, rather than chemical ones, improves the product's circularity potential. The claim is substantiated by a high, third-



⁴⁵ Statista (2023). [Average lifespan \(replacement cycle length\) of smartphones worldwide from 2013 to 2020](#)

party rating on the French Repairability Index.

E-Waste

The mobile phone industry has high chemical impacts related to e-waste. Effects from chemicals and substances such as flame retardants, heavy metals in circuit boards and phthalates in cables may be seen when electronics are taken apart or components burned.

Through consumer engagement and education, as well as a take-back and e-waste offsetting program, the company aims to 'nudge' consumers into better recycling habits to reduce these impacts.

Reducing chemicals of concern in the product

Fairphone provides information on its website to inform the consumer about the effects of chemicals in production and e-waste. For example, it includes an article on [Safety and hazardous materials](#), which discusses the key issues, compliance mechanisms, supplier selection processes, and action it has taken to phase out substances such as PVC and phthalates, and alternatives used. However, the report is transparent on some of the challenges that remain on phasing out other hazardous substances. Again, this aims to enable understanding of the issue for consumer to inform future purchase choices. Besides, since 2017, Fairphone has been an active member of the [Clean Electronics Production Network \(CEPN\)](#), a multi-stakeholder network addressing processing chemicals used in manufacturing that don't end up in the final product, for example cleaning chemicals or solvents. CEPN's goal is to "move toward zero exposure of workers to toxic chemicals in electronics manufacturing".

Reducing the impacts of raw material extraction

Extraction of raw materials used in mobile phones have high impacts – these include social and economic (in relation to labour practices and land use from mining), but also chemical, such as acid and heavy metal leaching.

Fairphone seeks to strongly engage the consumer on the impacts of mining and understanding where materials come from.

Extensive information on the topic is provided on its website, and the phone even includes a map of the Democratic Republic of Congo (DRC) inside the case, showing the origin of key metals used.



Reuse and recycling starts with you

We launched our recycling program to do our part to reduce electronic waste, and we're looking forward to your participation

Our approach: Responsible mining and recycled materials

We want the materials in our phones to come from more sustainable sources that deliver social and environmental benefits. To achieve this, we're tracking where our phone's materials come from and then finding and creating demand for more responsibly-sourced materials.

Instead of turning away from mines and countries where human rights and environmental risks are present, we engage and invest in improvements. For responsible mining, we will focus on artisanal and small-scale mining (ASM). Often operating outside the formal mining sector (and related regulations), these types of mines offer the most potential for directly improving the lives of miners and their families. The ASM mining sector employs around 44 million people in the world, indirectly creating employment in auxiliary sectors of 40 million people and supporting an additional estimated 150-200 million people.

Besides that, more industry efforts are needed to scale the effective recycling of post-consumer waste and ensure more responsible recycling. We invest in and innovate models for post-consumer recycled materials and improve recyclability through our modular design.



MULTI-CHANNEL AND INNOVATIVE APPROACH



Engage with consumers in diverse ways

- Various complementing communication channels used.
- Different user groups addressed with different channels.
- Information complementary and not overloading the consumer.

Providing highly effective and engaging sustainability information often involves utilizing more than one communication channel. The most effective approach generally differs, depending on the consumer's preferred method of receiving information. Different age groups may be more fluent with digital means of communication and use of social media than others. For some, the experience of physically seeing and touching a product is a key part of their purchase decision.

Improving sustainability of products sometimes involves smaller, incremental improvements, and in other cases, innovation that is strongly differentiated from the market norm. In the latter case, new materials and variants of products may initially have low acceptance among consumers.

This may be due to a strong preference for existing types and designs. For example, the construction industry is considered conservative, with a low appetite for risk and has historically shown a preference for conventional products and materials. However, change may be necessary as a result of shifts in the market from both regulation and innovation. Some conventional building materials have had to change their formulation or remove or reduce use of a chemical. Additionally, a company may take the approach of maintaining a product's function, but opt for an entirely different design or material to reduce chemical impacts, rather than taking a substitution approach. Examples of this include:

- PVC flooring can be replaced by substances such as cork or linoleum, to remove the need to substitute phthalates
- Conventional carpet can be replaced by materials such as jute, wool and sisal that remove the need for certain additives
- Water-based, or in some cases casein or clay paints, can be used instead of solvent-based paints to reduce VOC content in indoor air.

However, initial acceptance of these different products, materials and approaches can be low due to perceived or real durability, or other cost or performance trade-offs. To address this barrier, a multi-channel approach to communicating sustainability benefits can be used. Whilst ensuring that claims made follow the fundamental principles, complementary approaches to communications can be beneficial. These could include in-person demonstrations and providing product samples in stores and trade shows; visual content, such as videos or 'virtual' platforms to show how to use different products and how they perform.

Additionally, companies can engage with the consumer on the impacts of their purchase across the full product life cycle. Narrative content such as explaining the journey of more sustainable products and impacts avoided can be a powerful engagement tool beyond only providing specifications.

Content should not overload the consumer. Taking an engaging and entertaining approach can also increase the effectiveness of the communication.

Effective multi-channel engagement to communicate the benefits of alternatives to traditional floor coverings

Good practice has been demonstrated in the floor coverings market by companies offering alternatives to standard flooring products. PVC flooring and conventional carpet are mainstream building materials with a high market share. However, both have associated chemical impacts.

Instead of a substitution approach, use of entirely different floor covering materials with lower chemical impacts are available. However, to engage the consumer to consider these materials may be challenging. Engagement beyond only providing information online has benefits, as it enables consumers to see and feel the materials, and receive more information on chemical content from expert sources.

An effective example was seen from the carpet manufacturer [Tretford](#), which has achieved the Blue Angel certification for its EVER cashmere-based carpet product. The company offers free samples of the material to enable customers to experience the look and feel of the material as an alternative to carpet.

[Forbo](#), which has achieved several ecolabels for its marmoleum flooring which can be used instead of PVC, enables direct consumer interaction through showroom demonstrations of the material. The company plans to go one step further in 2022 by carrying out a [mobile roadshow](#), using a truck with a mock-up of a home inside featuring the flooring, and meeting consumers to demonstrate the benefits of the material.

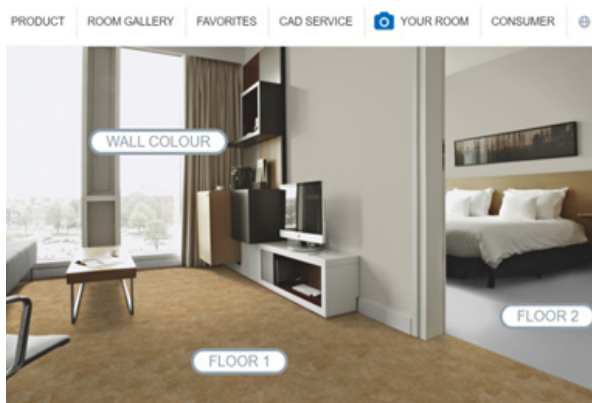
Other multi-channel approaches used by Forbo include social media engagement, and videos, and virtual design tools, where the consumer can upload a picture of a room and see how the material looks.



Free wool carpet samples from Tretford



Forbo roadshow demonstration (above, below, and left side)



COLLABORATION



Work with others to increase acceptance and credibility

- Broad range of stakeholders included in claim development and communication.
- Joint communication channels employed.
- Inclusive language used to make consumers feel part of a movement

Companies can bring more credibility to claims made by forming external partnerships. This can help to address a sustainability issue, or prove the performance of a new material, product or functionality in relation to its chemical ingredients. This approach can be particularly beneficial for small and medium sized companies, who may lack technical and financial resources to test particular chemicals or identify safe substitutions. Collaborations with external organizations can also help to recognize and address problems more quickly and effectively.

Collaboration activities can involve working with independent bodies such as NGOs, test houses and research institutions. Companies may wish to conduct testing of a product, or gain a certification. Collaborations can also be used to conduct a more qualitative user trial – this can help to prove performance and gain consumer acceptance of a new product, or a variation on a conventional one. It should be ensured that this type of activity uses an approved methodology and balanced, peer-reviewed reporting of results and conclusions.

In some cases, it is useful for companies within a sector to come together and recognize an industry-wide problem. This can enable further transparency and help establish a consensus. In the context of chemicals, a collaboration may seek to establish a strong body of evidence around the effects of a particular substance, to determine whether it should be restricted or removed from a product type, or which alternatives are viable. Companies can in some cases share knowledge and pool resources to identify the best course of action for the industry as a whole.

Improving the sustainability of waterproof materials – collaborative, joint communication and engaging multiple stakeholders

The issue of per- and poly-fluorinated alkyl substances (PFAS) used in durable water repellents (DWR) has seen increased scrutiny in recent years. Efforts by the outdoor clothing sector remain in progress to reduce impacts and find alternatives. [PFAS](#) are highly persistent chemicals, that have suspected developmental and reproductive effects.

The sector's response has been varied, but almost all are currently aiming to find and develop alternatives. Some manufacturers have already moved to lower-impact alternatives (e.g. from C8 to C6 compounds), but which are still subject to some of the same concerns.

Some PFAS-free alternatives have been identified through various studies. Developing the current body of evidence has involved a number of independent organizations, such as the Green Science Policy Institute, who have conducted extensive research and work to improve transparency of reporting.



SEPTEMBER 30, 2021 – SEPTEMBER 11, 2021

GORE INTRODUCES PFC-FREE WEATHERPROOFING

Gore Fabrics, the maker of GORE-TEX® and its weatherproofing, has announced a major new product technology, with the introduction of its consumer outdoor clothing products that are completely PFC free. The announcement is a result of a long-standing Greenpeace campaign with outdoor clothing brands to remove harmful PFAS used in waterproof clothing. [Learn more](#)



SUPFES

Examples of effective collaboration to improve the credibility of communications include:

- A number of outdoor apparel manufacturers have signed up to the [Greenpeace Detox Programme](#), a commitment to phase out hazardous chemicals from their products
- Several companies are working with the Bluesign® certification programme, enabling use of their database of chemicals and [Finder list](#), which helps identify PFAS-free alternatives
- Haglofs participated in the [SUPFES project](#) alongside academic institutions in Sweden and the Netherlands to conduct and publish research on PFAS alternatives
- Several companies have joined the Green Science Policy Institute PFAS-free products list, on the condition that [eligibility standards](#) are met.

Whilst the challenge to find safer alternatives to PFAS is ongoing, there have been positive examples seen of collaboration with independent organizations to ensure balanced communication on the current state of play and future direction for the industry.



PFAS-Free Products

For more information about these products, click links and see footnotes.

If you would like your product added to this page, please see our [Eligibility Criteria](#) or email Seth@GreenSciencePolicy.org

Outdoor Gear



Rain Gear:

- Columbia (Outdry Ex Eco products, [policy](#))
- Deuter (all products, [policy](#))
- Didriksons (all products, [policy](#))¹
- Endura (select products, [policy](#))
- Jack Wolfskin (all products, [policy](#))
- Marmot (select products, [policy](#))²
- Marmot (EvoDry rainwear products, [policy](#))
- Nau (all products, [policy](#))
- Páramo (all products, [policy](#))
- prAna (select products, [policy](#))³
- Royal Robbins (select products, [policy](#))⁴
- Vaude (all apparel products, [policy](#))

COMPARABILITY



Help consumers choose between similar products

- Product comparisons substantiated and helpful for consumers.
- Approaches initiated by government or third parties followed.
- Specific guidance followed.

Being able to make an objective comparison between sustainability aspects of products can have benefits in guiding the consumer and gaining market advantage, but is not always straightforward, particularly in the context of chemicals in products. Additionally, in some regions, there are defined codes on what can and cannot be said in marketing claims, when comparing a product to that of a competitor.

Making comparisons requires a fair means of measuring aspects, such as a product's composition or performance. In some cases, established standards are in place. However, other aspects may require consideration, such as the quality of the product or its intended functionality. In the example of paints, limits and methods for measuring chemical content (such as volatile organic compounds) are well-established, and it is straightforward to compare this aspect. However, quality and performance aspects such as coverage and drying time may vary, and an overall comparison may need to take multiple aspects into account.

Other initiatives enable a comparison framework for products, such as Environmental Product Declarations, that have defined product category rules (PCR) aiming to quantify the various impacts of products based on life cycle assessment.

Ultimately, whilst comparisons between products can be a valuable communication tool to help consumers identify lower impact products, in the context of chemicals, companies should exercise care that comparisons are valid and useful for the consumer. A comparison could be against a similar product, the market average or a leading product, but context should be provided.

If demonstrating that a product is improved compared to another on the basis of chemical content, companies should ensure they have sufficient evidence and certainty that the product does not have other unintended consequences or reduced performance. It is recommended to check details of the comparison with experts, or an issuing certification body if the claim involves such a scheme.

Product: Insulation board



Do (company A)

Earthwool® Insulation Board - Unfaced by Knauf Insulation, Inc.		Health Product Declaration v2.2 <small>created via: HPDC Online Builder</small>	
<small>HPD UNIQUE IDENTIFIER: 23750</small> <small>CLASSIFICATION: 07 21 13 Board Insulation</small> <small>PRODUCT DESCRIPTION: This is a glass mineral wool board product with bio-based binder derived from corn and the glass has a high degree of recycled glass content. This is the only formaldehyde free glass mineral wool board product available on the market today. In addition to traditional uses, this product may be fabric wrapped as an excellent sound absorber for commercial environments.</small>			
Section 1: Summary		Basic Method / Product Threshold	
CONTENT INVENTORY			
Inventory Reporting Format <input type="radio"/> Nested Materials Method <input checked="" type="radio"/> Basic Method Threshold Disclosed Per <input type="radio"/> Material <input checked="" type="radio"/> Product	Threshold level <input checked="" type="radio"/> 100 ppm <input type="radio"/> 1,000 ppm <input type="radio"/> Per GHS SDS <input type="radio"/> Other	Residuals/Impurities <input type="radio"/> Considered <input checked="" type="radio"/> Partially Considered <input type="radio"/> Not Considered Explanation(s) provided for Residuals/Impurities? <input checked="" type="radio"/> Yes <input type="radio"/> No	<i>All Substances Above the Threshold Indicated Are:</i> Characterized <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>% weight and role provided for all substances.</i> Screened <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>All substances screened using Priority Hazard Lists with results disclosed.</i> Identified <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>One or more substances not disclosed by Name (Specific or Generic) and Identifier and/ or one or more Special Condition did not follow guidance.</i>

Use of a Health Product Declaration (HPD)

- Similar to an Environmental Product Declaration, a Health Product Declaration enables a company to communicate chemical related aspects of the product, allowing the consumer to compare different products using the same set of criteria. HPDs, which are contained in the [HPD Repository](#) follow a defined methodology that allows consumers to compare the health profile of different materials. HPDs may be self-declared or third party verified, which can be checked in the database.
- Other similar approaches exist, such as the verified Material Health Statement (MHS) shown in the example of the Accessibility principle
- HPDs can be used in comparison alongside other tools and certifications, that can be used to compare other aspects of products.


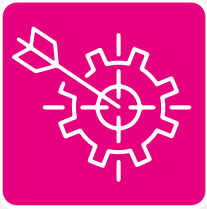
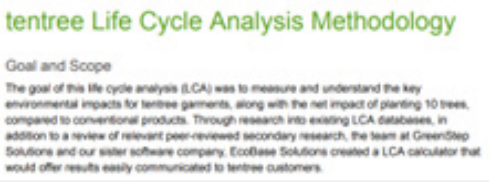



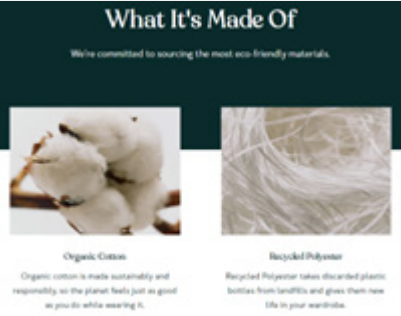
Don't (company B)



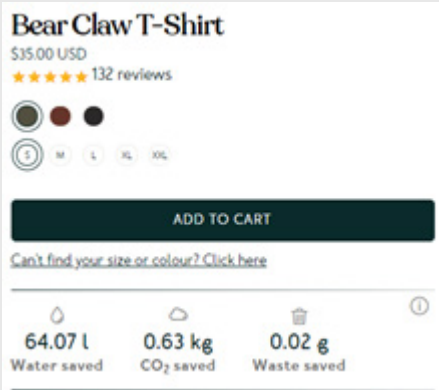

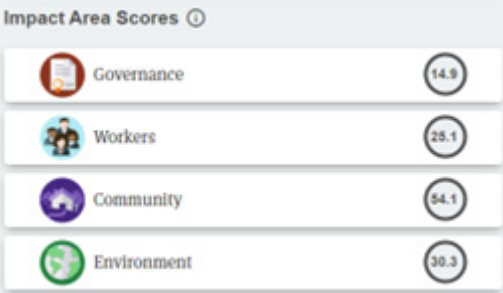
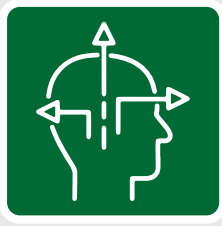
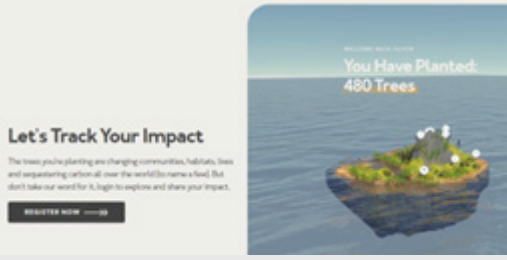
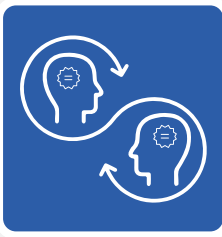

Our product		Competitor's product	
			
Non-toxic	✓	Contains flame retardants	✗
Made from natural materials	✓	Plastic-based	✗
Low-VOC	✓	Contains solvents	✗
Easy to install	✓	Requires specialist tradesperson and tools	✗

- Making unsubstantiated or subjective comparisons, without quoting standards, test data or another basis does not provide context, and may be inaccurate.
- The claim is not helpful for the consumer if it does not establish performance against a benchmark, for example the market average product.

2.3 ILLUSTRATING THE PRINCIPLES OF THE GUIDELINES: A COMPANY EXAMPLE

[Tentree](#), a Canadian clothing producer with a strong focus on sustainability, has been seen to take several best practice approaches to information provision and substantiation. Its customer engagement takes a holistic approach, exhibiting practices aligned with the principles of the Guidelines.

Principle	Example	Discussion
Reliability 	<ul style="list-style-type: none"> • Shell Fabric: 100% REPREVE Recycled Polyester. • bluesign® certified non-PFC water resistant. 	<p>Tentree draws on a number of certifications to substantiate the credentials of the materials used in reducing the use of chemicals of concern such as PFCs, and lower embodied carbon fibres.</p> <p>Certifications referenced include REPREVE, bluesign®, GOTS and the Global Recycling Standard (GRS).</p>
Relevance 	 <p>tentree Life Cycle Analysis Methodology</p> <p>Goal and Scope The goal of this life cycle analysis (LCA) was to measure and understand the key environmental impacts for tentree garments, along with the net impact of planting 10 trees, compared to conventional products. Through research into existing LCA databases, in addition to a review of relevant peer-reviewed secondary research, the team at GreenStep Solutions and our sister software company, EcoBase Solutions created a LCA calculator that would offer results easily communicated to tentree customers.</p>	<p>Tentree has undertaken Life Cycle Analysis of its products alongside the third-party sustainability consultancy EcoBase. Its methodology and assumptions are published on its website.</p> <p>This ensures the main impacts of its products and activities are identified and quantified.</p>
Transparency 	 <p>CLIMATE NEUTRAL</p> <p>Let's Get Transparent: Climate Neutral Certification</p>	<p>The company's blog includes an article giving details of what its Climate Neutral Certification consists of, and how it went about achieving it.</p> <p>The article gave details of how it measured its CO₂ emissions, detailing a figure of 9,249 tCO₂. Splits of this figure between different operations was included in the article, as well as detailed of offsets purchased.</p>
Accessibility 	 <p>What It's Made Of</p> <p>We're committed to sourcing the most eco-friendly materials.</p> <p>Organic Cotton Organic cotton is made sustainably and responsibly, so the planet feels just as good as you do while wearing it.</p> <p>Recycled Polyester Recycled Polyester takes discarded plastic bottles from landfills and gives them new life in your wardrobe.</p>	<p>Tentree provides information on the materials used in its products in an accessible way – product pages include information about the benefits of materials such as recycled polyester and organic cotton.</p> <p>Further detail is provided on a dedicated, easy-to-find materials page.</p>

Principle	Example	Discussion
<p>Clarity</p>  <p>Comparability</p> 		<p>Sustainability claims made are specific and quantified for the particular product, with a link to further information on the calculation methodology and assumptions made.</p> <p>This includes details of the industry averages used for comparison of their clothing line.</p>
<p>Three dimensions of sustainability</p> 		<p>The company shows a high level of transparency on its website – this displays its B-Corp certification score which links to the certification platform, giving details of how the company performs compared to others; this includes a score for Toxin Reduction/Remediation, alongside other environmental and social metrics.</p> <p>Tentree also openly reports details of the factories it uses in production, maintain BSCI and SA8000 certifications, audits and details of a code of conduct for ethical practices in factories.</p>
<p>Behaviour change & longer term impact</p> 		<p>Tentree has developed an 'Eco-log' platform, alongside the independent environmental group GreenStep.</p> <p>This enables customers access data on their purchases and assess the impact of their purchases against the industry average. This enables an ongoing collaboration with their customer base.</p>
<p>Collaboration</p> 		<p>The company seeks to build a community with customers around sustainability. This is done through varied communication channels and collaborative platforms. Language used is inclusive to help the customer feel they are participating in a solution. The topics of its blog are varied - as well as providing content related to Tentree's products, it includes sustainable lifestyle tips and commentary on high-level environmental news and issues.</p>



3 FURTHER GUIDANCE ON PROVIDING EFFECTIVE SUSTAINABILITY INFORMATION RELATED TO CHEMICALS

3.1 UNDERSTANDING THE ISSUE: SUBSTITUTION OF CHEMICALS OF CONCERN, AND EFFECTIVE COMMUNICATION OF ALTERNATIVES

Developing an effective understanding around some of the key technical aspects of chemicals is recommended to help companies develop product sustainability strategies, and communicate effectively. Support is available from a range of actors – these might include companies specializing in regulatory compliance, technical specialists, or NGOs operating in the chemical sector. Joining industry alliances and groups can also help with information sharing and knowledge development on key topics.

One such key topic in relation to chemicals is substitution. A wide range of chemical alternatives are designed as a “drop-in” to replace substances of concern, including those that have been banned. However, lessons must be learned from previous experiences of chemicals that were used widely, only to later be found to be harmful. Alternatives must be subject to rigour in their testing and approval process, so as to avoid ‘regrettable substitutions’ – where a substance is replaced by another that is just as harmful, or potentially worse. As well as the core issue the substitute seeks to address, the ‘unknown unknowns’ must also be strongly considered.

As with the first generation of synthetic substances, the effects of today’s alternatives may take the order of years to be fully understood. The means by which these alternative substances are communicated plays a vital role alongside the efforts to test and validate their effects.

Effective communication of chemical substitutes

Where a chemical has been used as a substitute, the fundamental principles outlined in the Guidelines can be used to guide sustainability claims related to such substitutions to ensure that claims made are substantiated, clear and convey a genuine benefit.

Principle	Discussion
	<p>If a substitution has taken place, how proven is the alternative? Avoiding 'regrettable substitutions' is key, and marketing statements should not declare an alternative is safer or performs better if testing or evidence of longer-term effects cannot substantiate this. Where a reliable source does not yet back up the substitution, it is preferable to not make any statement suggesting an improved situation, rather than declaring a benefit purely because a substitution has taken place.</p> <p>Where a manufacturer is looking to make a 'drop-in' substitution, several sources exist that identify safer options – for example the ChemSec Marketplace, or the BlueSign Finder Positive Chemicals list. Communications referring to use of external, impartial resources can provide assurance to consumers.</p>
	<p>When a chemical substitution is made, it should be communicated to the consumer only if it is relevant to the core sustainability performance of the product. For instance, if an industry is replacing hazardous chemicals in ink on the packaging but not on the toy itself, and is advertising it, the relevance principle is not met. Avoiding burden shifting in substitutions is important – for example a substance may not be a carcinogen compared to the one it replaces, but may have greater toxicity to aquatic organisms.</p>
	<p>Communicating that a substance has been removed from a product, without details of what it has been replaced with may mask a substitution that is not an improvement. Caution should be exercised when a product is declared to be free of a particular substance, rather than the substance class. Information should also be made available about the substituted chemical.</p> <p>Substitute compounds may be chemically related to the original substance, with similar properties and effects. However, users may not be familiar with the exact chemical, and it may not be subject to the same regulation – leading to reduced barriers to market entry and use.</p>
	<p>If the removal of the original substance is being communicated as a benefit, then the reason for the choice of the substitute should be made clear, and detail should be provided on exactly how the product is improved.</p> <p>The use of ambiguous terminology that does not address the specific issue can mislead the consumer, suggesting a product has improved more than it actually has.</p>
	<p>Companies may communicate that a chemical has been removed from a product, but may put information on the replacement in a difficult to find place. Good practice has been seen of companies using Material Health Statements or Health Product Declarations, alongside effective provision of a safety data sheet, which communicate the chemical ingredients of a product. This makes it possible for the consumer to carry out their own research on the replacement substance, and others included in the product.</p> <p>Good examples of accessible information also include where a company provides easily connected information and narrative on common chemicals used in the sector in general and replacement substances being used. Additionally, it is good practice to link to a third-party source that identifies and provides assessment of alternatives, such as the ChemSec Alternatives Marketplace.</p>

BOX 3 - EXAMPLE: INTEGRATING A PROACTIVE APPROACH TO CHEMICAL SUBSTITUTION INTO PRODUCT SUSTAINABILITY COMMUNICATION

When chemicals are phased out of use in products based on health or environmental concerns, they are usually replaced by other chemicals providing the same or a similar function. If the hazards and potential adverse impacts on health or the environment of these substitutes are not adequately assessed, this process can result in 'regrettable substitution', where the alternative turns out either to have an unexpected hazard of similar or worse toxicity than the original chemical, or shifts the burden of the hazard to another entity.

For companies who can demonstrate that they have only used known, safe substances in their products, this becomes a powerful communication and sales tool. Using only chemicals in products that have been thoroughly researched and with known effects enables more reliability and substantiation in claims made, providing increased certainty in communication activities. This approach can create a strong market 'pull' effect – enabling manufacturers who have exercised high due diligence in chemical management to differentiate their products, and encouraging others to do the same.

An example of this approach has been demonstrated by [TCO Certified](#), a sustainability labelling scheme for IT and electronics products. [As explained in a blog post⁴⁶](#), the scheme suggests a more proactive approach of only using substances which have been thoroughly assessed would enable more effective chemical management.

TCO Certified changed their approach in 2015 by developing an 'accepted list' rather than a 'restricted list' of substances. Whilst this is a relatively small list, this enables greater transparency in what is being used, with the effects known. By this approach, products that include chemicals that have not yet been assessed, or do not meet limits, or where the manufacturer is not declaring the substance, cannot achieve the certification.



⁴⁶ TCO Certified (2021). [Guilty until proven otherwise – the right strategy for chemicals](#)


3.2

COMMON CLAIMS AND ‘MYTH-BUSTING’ - ADDRESSING MISCONCEPTIONS RELATED TO CHEMICALS IN PRODUCTS


This section explores some of the common sustainability claims and statements made in relation to chemicals in products. Fact-checking and ‘myth-busting’ of some of these claims is outlined, alongside consideration of the principles of the Guidelines. Some claims seen on chemicals would benefit from being more nuanced, and whilst not necessarily incorrect, may imply benefits that are not fully accurate.

Table 6 - Common sustainability claims seen

Product/Claim	Discussion
<p>“Free from” claims</p>	<p>Examples have been seen of products that claim to be “free from” a substance. In the context of chemicals, there have been many examples of substances where there is sufficient consensus on their risks that they have been regulated in some regions, or industry has moved to alternatives.</p> <p>In these more certain cases, there is benefit in advising the consumer that the product does not contain a known harmful substance. As stated earlier in the ‘Relevance’ principle, claims should not go so far as to suggest removal of a banned substance is providing more benefit than the legal minimum.</p> <p>However, some cases related to removal or substitution of a chemical require further consideration. When declaring a product to be “free from” a chemical, an effective claim should also consider the following:</p> <ul style="list-style-type: none"> • What is the rationale for removing the chemical? • Has the chemical been substituted? What is known about the replacing chemical, and how has it improved the product? • Are there issues connected to other chemicals in the product that have not been mentioned? • If no replacement has been made, or the product has seen a change to its formulation, has the performance been affected? <p>In some cases, this type of claim can be effective, provided the company is transparent in reporting what the substitute is, and what lengths it has gone to ensure the product has been improved overall as a result. However, in some cases, “free from” claims can be misleading and create a false sense of security, being perceived by some users that the substitution by nature has addressed the main concerns associated with the product.</p> <p>Examples of common “free from” claims related to the product groups considered in this supplement are explored below.</p>


Product/Claim	Discussion
<p data-bbox="161 271 480 300">Soft plastic toys - "BPA free"</p> 	<p data-bbox="517 271 1114 300">Myth – “BPA-free products have no health effects”</p> <p data-bbox="517 331 1422 434">BPA (Bisphenol-A), which has been used for over 40 years as a plastic hardener – is found in some polycarbonate plastics, epoxy resins in food and beverage containers, soft plastic toys and drinking cups.</p> <p data-bbox="517 465 1430 792">Emerging evidence is indicating risks from BPA to human health and the environment based on concerns of high reproductive toxicity and (potential) endocrine disruption. Available government assessments have concluded that BPA may cause multiple adverse effects on human health and concern has particularly been raised around exposure in younger children, with higher risks due to their lower body weight. Whilst full consensus has yet to be reached, six US states have either restricted or banned the sale of certain BPA-containing products in recent years and some government assessments have substantially lowered estimated safety limits.</p> <p data-bbox="517 824 1414 994">Consumer awareness of BPA has increased in recent years, and at the same time the number of manufacturers claims of “BPA-free” particularly in products for infants has also risen. Several companies have produced an array of marks declaring “BPA-free” that consumers may believe are accredited third party schemes.</p> <p data-bbox="517 1025 1433 1173">In some cases, BPA may be replaced by related substances with similar properties and effects. For example, Bisphenol-S or -F (BPS, BPF) has been used as a substitute. The effects of BPS and BPF are not yet fully known, despite “existing scientific evidence of potential adverse effects”⁴⁷.</p> <p data-bbox="517 1205 724 1234">Action to address:</p> <ul data-bbox="517 1265 1437 1594" style="list-style-type: none"> • Care could be taken when communicating that a product is “BPA-free”, and it is not recommended to make the claim without certainty that a regrettable substitution has not occurred. • If the effects of any other plastic additive substances contained within the product are not fully understood, or suspected to be detrimental, then the claim should not be made in isolation, implying an overall benefit. • The use of symbols or marks that could be confused with third party schemes is not recommended.

⁴⁷ United Nations Environment Programme (UNEP) (2020). [An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment](#)

Product/Claim	Discussion
<p data-bbox="153 271 488 338">Waterproof clothing – “PFOA-free”</p> 	<p data-bbox="517 271 1410 636">Perfluorooctanoic acid (PFOA) is a synthetic substance that has been used in waterproofing, non-stick cookware and as a surfactant. PFOA, also known as ‘C8’, is one the best known of the family of PFAS (Per and Polyfluorinated Alkyl Substances), which have a strong ability to resist heat, oil, grease and water. However, these compounds exhibit potentially decades-long persistence – causing them to be known as ‘forever chemicals’. Long-chain PFAS have been associated with health concerns, including carcinogenic, developmental and immune effects, while for other PFAS evidence for human health concerns are emerging⁴⁸. PFOA and its precursors were added to the Stockholm Convention Persistent Organic Pollutants (POPs) list in 2019⁴⁹.</p> <p data-bbox="517 667 1437 920">However, confusion exists in how these substances are reported. Declaring a product as PFAS- or PFC-free, or “free of fluorinated chemicals” confirms that the broader family is not present. Some textiles product manufacturers are listed in a PFAS-free database. However, substance-specific claims such as “PFOA-free” may mean substitution by another PFAS, often the C6 compounds such as GenX or PFBS, which have also come under scrutiny for also having potential health concerns.</p> <p data-bbox="517 952 1445 1128">Different approaches have been seen by the waterproof clothing industry in communicating the transition away from PFAS and PFC-based materials. Some manufacturers have shown a high degree of transparency in communicating that they are still using PFAS substances such as C6 whilst they work on development of alternatives.</p> <p data-bbox="517 1160 730 1189">Action to address :</p> <ul data-bbox="517 1220 1437 1554" style="list-style-type: none"> • Claims made of removal of the PFC/PFAS group of substances are preferable, but the substituted chemical should be identified or described as far as possible. • Claiming ‘PFOA-free’ may be misleading if no further detail is provided on the material used, and suggesting a benefit beyond current standard industry practice. • Where substances used are featured in databases such as Bluesign or the ChemSec MarketPlace, a link should be provided to educate the consumer.
<p data-bbox="153 1588 488 1655">Spray foam – “Isocyanate-free coatings”</p>	<p data-bbox="517 1588 1445 1839">Isocyanates are used in various polyurethane-based spray foam fillers, insulations and adhesives, acting as a curing agent. Correct safety measures are essential when installing the product – before curing has taken place, there are hazards, related to developing respiratory conditions from inhalation, either to the installer, or an occupant accessing an area too soon. This can be mitigated by use of the appropriate personal protective equipment (PPE) and other safety procedures. Once cured, the foam is inert.</p>

⁴⁸ United Nations Environment Programme (UNEP) (2019). [Global Chemicals Outlook II](#)

⁴⁹ CHEManager (2019). [PFOA Added to Stockholm Convention POP list](#)

Product/Claim	Discussion
	<p>Alternatives exist to use of isocyanates. Epoxy, rather than polyurethane foams use amine-based curing agents. These have also been associated with similar health concerns if inhaled.</p> <p>Action to address:</p> <ul style="list-style-type: none"> • When communicating that a product is isocyanate-free, details of the alternative used could be transparent and easily accessible – the health risk may not be diminished as a result of substitution. • Care could be taken that no part of making this claim results in unintended consequences. For example, communicating that a product is isocyanate-free should not detract or distract from essential information to be provided on the amount of product to be used, or safety procedures and competence that should be in place for installation.
<p>“CE marked”</p> 	<p>Myth – “CE marked products are better performing and contain fewer chemicals”</p> <p>CE marking is a legal duty required by a company who places a product on the market in the EU (including imports from outside the EU). It is a legal binding declaration by the company that the product meets the applicable, legal harmonized standards outlined in Directives or other regulations, which may cover safety, technical, health and environmental aspects. The CE marking is not a label and does not provide consumer information going beyond legal compliance.</p> <p>For some newer products, a harmonized standard may not yet be in place. For building products in this instance, the company may have to go down a different route to bring the product to market. A European Technical Approval (ETA) generally has to be gained through a competent body, in the absence of CE marking. This may include developing new test methods to assess the product, if none are already in place.</p> <p>Many consumers are not familiar with CE marking, believing it to be an indication of performance, rather than the company’s own declaration of conformity with standards required to place a product on the market in the EU.</p> <p>Another misconception among consumers is that a product will always have been third-party tested as part of CE marking – in fact, the basis of a company’s conformity may have highly varied degrees of reliability. Reputable companies will often use independent testing, but not all products placed on the market have been found to perform as declared against the specified standard, with no evidence of robust and substantiated data.</p> <p>However, market surveillance authorities often lack the resource to monitor the full breadth of products on the market. Whilst products imported into the EU have to demonstrate the same conformity as EU suppliers, and the importer is responsible for compliance, where these have been seen to not meet standards, it may be difficult to trace the non-conformity to the original producer through complex supply chains.</p>

Product/Claim	Discussion
	<p>Some claims made have been seen where CE marking is promoted as a beneficial attribute of the product, rather than a minimum conformity declaration. This type of statement may be diverting attention from the fact that a product has not been subject to reliable performance testing, and can be misleading for consumers.</p> <p>Action to address:</p> <ul style="list-style-type: none"> • Companies are encouraged to not communicate about CE marking in a way that implies it is going above minimum legal requirements, or suggest it is a certification mark issued by a third party. • This does not mean that a company cannot communicate about good performance of the product that has been seen in tests, provided this is substantiated. For example, the European Union Toy Safety Directive (2009/48/EC) specifies limits for chemicals in some products. A claim could communicate the results of testing that a CE-compliant toy had chemical levels lower than the market average. • CE marking Declarations of Performance could be made available on websites – providing this by an accessible means can provide assurance to the consumer and assist regulators with market surveillance.
<p>“Plant-based” or “Bio-based materials”</p> 	<p>Myth: “Bio-based products are natural and as a result, safer”</p> <p>According to some studies, a low level of consumer understanding⁵⁰ has been found with terms such as “bio-based” and “biodegradable”. Products described as bio-based, which are derived from biomass sources, may be perceived to be safer to humans and the environment, when in fact the end material may be no different to that made through fossil-based production. As such, the product’s safety is not a function of its manufacturing route.</p> <p>Certifications are available to quantify the bio-based content of a material, and in some cases these cover additional aspects, such as the sustainability of the bio-based feedstocks used. With consumer understanding reported to be low on this issue, it is beneficial for manufacturers to go further in information provision and explain exactly what bio-based materials are, and how their use improves and reduces the impact of the product. It may be worthwhile to provide complementary information on chemical safety alongside this.</p> <p>Action to address:</p> <ul style="list-style-type: none"> • A number of certification schemes exist to confirm bio-based content of a product. However, some of these use slightly different metrics to convey the amount of bio-based content (this may be quoted as a proportion of the product weight, or of the organic component of the product). Use of a third-party mark is preferable to a self-declaration that the product contains bio-based or plant-based material, as this enables independent recognition.

⁵⁰ Sijtsema et al (2016). [Consumer perception of bio-based products—An exploratory study in 5 European countries](#)

Product/Claim	Discussion
	<ul style="list-style-type: none"><li data-bbox="518 262 1452 414">• Quoting the amount of bio-based content and how this was measured is recommended. The industry test method for bio-based content is ASTM D6866, Standard Test Methods for Determining the Bio-based Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis.<li data-bbox="518 436 1452 589">• As consumer confusion has been reported between different terminology similar to “bio-based”, it is beneficial to provide further context and consumer information on what bio-based means for the product in practice, and how this improves the product compared to using a fossil-based feedstock.<li data-bbox="518 611 1452 716">• Claims should be transparent on any toxicity concerns of the product, as the term “bio-based” may be perceived by some users that the product has inherently lower toxicity.



4 RECOMMENDATIONS

Practical recommendations are made below for product manufacturers and suppliers making sustainability claims in relation to chemicals in products. These are aimed at staff involved in product sourcing, as well as marketing and communications professionals. Recommendations for policymakers regarding associated information provision are also included.

4.1 RECOMMENDATIONS FOR MANUFACTURERS AND SUPPLIERS

Develop sustainability strategies for products, including how these aspects will be communicated

- Developing a sustainability strategy, that establishes key principles for products to achieve, supported by effective processes and frameworks, can have multiple benefits. This can strengthen compliance efforts, but also be a useful tool to differentiate products from competitors. As well as setting limits and standards for chemical use in products, this activity can also include developing templates and checklists for how to best communicate sustainability aspects.
- Explore product testing, gaining product certifications and using chemical assessment tools. Available budgets for this may vary, but expert partners can advise on how to maximize the return from investment in these activities. All of these activities can help improve processes for identifying potential chemicals of concern, assessing alternatives, and providing assurance to consumers that sustainability claims made are accurate.

Seek assistance and peer review when making environmental claims

- If resource or internal expertise is lacking in the company, manufacturers and suppliers are encouraged to seek the inputs of external experts with knowledge of chemicals and green claims guidance frameworks, such as sustainability practitioners or specialist chemical consultants.
- Collaborate with third parties such as research and academic institutions and test houses. This can be beneficial by enhancing a company's evidence base behind validation of new chemical substances and associated product performance, avoid regrettable substitutions, and improve the impartiality and credibility of claims.
- Organize regular training sessions and refreshers for staff involved in making sustainability claims, to build and sustain knowledge on chemicals.
- Conduct regular monitoring of developments related to the market position on a chemical, regulation and research on reported effects. This could be done using the inputs of compliance and technical specialists, regulators and academic and research institutions.

Develop effective working relationships with regulatory bodies on chemical compliance and consumer messaging

- Engaging with, and maintaining ongoing relationships with regulatory bodies concerned with information provision (e.g. advertising standards bodies) is encouraged. This could help expose the challenges and develop solutions both for your own company, and the industry as a whole.
- Companies should be proactive in gaining approval for claims rather than reactive; approach regulatory bodies for peer review or validation of statements made before making these public.
- Contribute to awareness-raising of poor practice communications within the industry and engage in open dialogues and information sharing to help resolve issues with companies who make inaccurate claims. This can contribute to fairer market conditions.
- Engagement of bodies authorized to regulate chemicals in products is recommended. Improved information sharing and dialogue on chemical substitutions with regulators can support compliance and contribute to better overall market surveillance. An effective relationship with regulators can help companies fully understand what is required to bring new substances and formulations to market, manage confidentiality aspects⁵¹ and develop effective communications on chemicals in products.

Collaborate with other companies in the sector, and wider sustainability alliances

- Collaborate with other companies in the sector to enable shared insights and experiences on how to assess chemicals and make effective claims. In some cases, resources could be pooled to conduct activities such as testing, which can be used to strengthen communication activities.
- Collaborate with a wider range of organizations, e.g. governments, academics, international and non-governmental organizations. This can provide useful insights, and a valuable 'outsider perspective'. This can help build effective networks to gain support for communication activities, as well as being part of industry-wide activities and campaigns to improve the practice of the sector as a whole.

⁵¹ [According to the Dubai Declaration on International Chemical Management](#), in making information available, information on chemicals relating to the health and safety of humans and the environment should not be regarded as confidential

Proactively engage the consumer

- Start the conversation on chemicals of concern – what do consumers care about, and what is important for them to know? What do they like about what you or your competitors are doing and saying? Note that information on chemicals relating to the health and safety of humans and the environment should not be regarded as confidential.
- Gather feedback to ensure consumers understand your sustainability claims related to chemicals. These insights are valuable and can help improve communications. For example, organizing focus groups to see if claims related to chemicals are understood or accompanying evidence is clear can provide useful insights on how best to communicate.
- Be transparent with the consumer in communications about areas of improvement needed in relation to chemicals (for the company and the industry as a whole).
- Ensure that best practice claims and sustainability information related to chemicals is available to consumers of products sold through all channels, both in-store and online. This is particularly important given the increasing share of online sales.

Work with the supply chain to improve information provision to assist your communication activities

- Improve sourcing practices and enhance suppliers training on best practices and eco-innovation. This can help improve information availability of information on chemicals in products, as well as on social and economic sustainability dimensions such as working conditions and raw material sourcing.
- Introduce minimum standards and reporting requirements for suppliers on their use of chemicals in products. These should be thorough and consistent to enable effective comparison and reduce administrative burdens. Initiatives such as the NGO-led Global Minimum Transparency Standard⁵² (GMTS), and the Principles for Chemical Ingredient Disclosure⁵³ support this objective, by requiring companies to disclose information on hazardous chemicals in products across their full life cycle. These initiatives also seek to increase transparency of information for policymakers and consumers.

⁵² Global Chemical Transparency. [Global Minimum Transparency Standard](#)

⁵³ Clean Production Action (2021). [Principles for Chemical Ingredient Disclosure](#)

4.2 RECOMMENDATIONS FOR POLICYMAKERS

Ensure that consumers are adequately informed about the chemicals contained in their products

- Encourage the presence and enforcement of strong regulatory frameworks that affirmatively take action against false claims regarding chemicals in products.
- Encourage manufacturers and suppliers to align their sustainability communications related to chemicals in products with this supplement.
- Promote the use of ecolabelling initiatives that provide independent and competent assurance to sustainability claims made in relation to chemicals in products. Additionally, policymakers can set up national and regional ecolabels where these are not yet in place, underpinned by reliable, verified and stringent criteria.
- Incorporate sustainability requirements related to chemicals in public procurement decisions. This would drive demand for improved production processes, and an increased share of sustainable products on the market. This can be supported by providing:
 - » Training to procurement entities.
 - » Making recommendations on minimum standards and aligning with identified best practices.
 - » Working alongside ecolabels to identify certified products.
- Join international efforts to support the advancement of methods to measure the impacts of chemicals of concern, and of global best practices to promote and align the communication of product information related to chemicals.
- Ensure that national, regional and local policy on information provision informs and empowers the consumer. This may include setting stringent legislation and standards on information to be provided if this is not already in place. Other activities such as awareness raising campaigns and funded projects that can support better information provision on chemicals through the use of technology can assist consumers to make more informed choices, and subsequently influence the practices of the market.

ANNEX – REGIONAL REGULATIONS AND GUIDANCE ON INFORMATION AND GREEN CLAIMS

Region	Regulations	Guides
UK	Advertising Standards Agency Environmental Claims Code	Competition and Markets Authority (CMA) guidance on environmental claims on goods and services
EU	Directive 2005/29/EC of the European Parliament and Council concerning unfair business-to-consumer commercial practices in the internal market	European Green Deal – Standard methodology for making green claims
China	Advertising law of the PRC	
USA	FTC Act based on misleading environmental claims to consumers (Section 5)	Federal Trade Commission “Green Guides” Guides for the Use of Environmental Marketing Claims

5.2

LIST OF ACRONYMS

Abbreviation	Description
BPA	Bisphenol A
BPF	Bisphenol F
BPS	Bisphenol S
CARB	California Air Resources Board
CPCat	EPA Chemical and Product Categories
CE	Conformité Européene
DEHP	Di (2-ethylhexyl) phthalate
DiNP	Diisononyl phthalate
DWR	Durable Water Repellent
ETA	European Technical Approval
GenX	Trademark name for a synthetic, short-chain organofluorine chemical compound used as a replacement for PFOA
GHG	Greenhouse Gas
GOTS	Global Organic Textile Standard
GMTS	Global Minimum Transparency Standard
HFR	Halogenated Flame Retardant
HDP	Health Product Declaration
ISO 17025	Testing and Calibration Laboratories
ISO 17065	Conformity assessment – Requirements for bodies certifying products, processes and services
MDI	Methylene diphenyl diisocyanate
MHS	Material Health Statement
PBDE	Polybrominated Diphenylether
PCB	Polychlorinated Biphenyl
PCR	Product Category Rules
PFAS	Per- and Poly Fluorinated Alkyl Substance
PFBS	Perfluorobutane sulfonic acid
PFC	Per- and Poly Fluorinated Compound
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
POP	Persistent Organic Pollutant
PVC	Polyvinyl chloride
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RMI	Responsible Minerals Initiative

RoHS Directive	Restriction of Hazardous Substances Directive
SCIP	Substances of Concern In articles as such or in complex objects (Products)
SDG	Sustainable Development Goal
SDS	Safety Data Sheet
SPF	Spray Polyurethane Foam
SVHC	Substance of Very High Concern
TCSA	Toxic Substances Control Act
TDI	Toluene diisocyanate
UK CMA	UK Competition and Markets Authority
UK ASA	UK Advertising Standards Authority
UNEP	United Nations Environment Programme
US EPA	United States Environmental Protection Agency
US FTC	United States Federal Trade Commission
VCM	Vinyl chloride monomer
VOC	Volatile Organic Compound
WHO	World Health Organisation

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- Box 2 – Initiatives improving transparency on environmental, social, economic and governance issues.
- Box 3 – Example: Integrating a proactive approach to chemical substitution into product sustainability communication

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