**The AskREACH Christmas-test**

**Introduction**

When we as European consumers buy something, we automatically think that these products are safe. Our Christmas test shows that this is not the case: even in Christmas balls, artificial Christmas trees and lightchains, we have found plasticizers that are harmful to reproduction, toxic flame retardants and chlorinated paraffins that are harmful to the environment.

The good news is that consumers have the right to know from the seller or manufacturer of a product whether it contains substances that are harmful to our health or the environment. Thanks to the European chemicals regulation "REACH", these substances have been collected in a "candidate list" since 2007 and fall under the so-called "right for information". On request of a consumer, both producers and sellers are obliged to provide information on these so-called "Substances of Very High Concern" (SVHCs) and instructions on the safe use of the product.

SVHCs are proven:

* carcinogenic
* reprotoxic
* mutagenic
* endocrine disruptive or
* persistent, bioaccumulative and toxic

SVHC chemicals can be found in all types of everyday articles such as toys, shoes, clothing, furniture, jewellery, crockery, electronics and sports equipment.

These include substances such as plasticizers in plastic materials, flame retardants in textiles or furniture, heavy metal compounds, various dyes or so-called polycyclic aromatic hydrocarbon compounds.

**REACH**

REACH stands for "Registration, Evaluation, Authorisation and Restriction of Chemicals". The European REACH Regulation has regulated the handling of chemicals since 2007.

**Candidate list**

Certain substances of very high concern are defined in the REACH Regulation as SVHCs (Substances of Very High Concern). The SVHCs are listed in the "candidate list", which is updated twice a year and currently contains 201 different substances. "Candidates' because these substances are candidates for possible authorisation and therefore restrictions. In addition, these chemicals should be replaced by other, less dangerous ones as far as possible.

**Article 33**

Article 33 of REACH states that consumers have the right to know from the manufacturer or seller whether a given product contains SVHC substances. This information obligation applies as soon as at least one SVHC is present in a concentration of more than 0.1% of the total mass. The information must be made available on request within 45 days and must include at least the name of the SVHC substance.

On the one hand, this is a relatively long period of time and, in addition, only needs to be answered if an SVHC is contained. Thus, if a consumer does not receive a response to an SVHC request, this can either mean that no SVHC substance is contained, or that the request has been lost or remained unanswered.

Article 33 refers to almost all "solid products" such as appliances, clothing, furniture, toys or electronics. In the case of "non-solid" products such as foodstuffs, medicines, cosmetics, cleaning agents or paints, the obligation to provide information applies only to their packaging.

If a product contains an SVHC substance, this does not necessarily constitute an acute hazard, as the substance may be chemically bound, for example, inside an article. However, due to the possible undesirable properties of the substances, consumers may request information about their presence.

**Methods**

At various Austrian, German and Czechia retailers, artificial Christmas trees, Christmas tree ball sets and fairy lights were purchased randomly. A total of 33 samples were subsequently tested for SVHC substances in an external accredited test laboratory.

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| --- | --- |
| Product | number |
| artificial Christmas trees | 15 |
| Christmas tree balls and decoration | 11 |
| electric light chains | 7 |

All products were first pre-screened with a NITON XL3t 800 RFAhandheld spectrometer (X-ray fluorescence). With the X-ray fluorescence method (XRF method) metals can be detected in different materials, whereby we focused on lead and bromine in our test and, if bromine was detected, also on antimony. X-ray fluorescence measurement can provide good indications of the presence of brominated flame retardants (PBDE)[[1]](#footnote-2). Bromine is one of the main elements in the molecules of brominated flame retardants, and antimony is used as an enhancer. In addition, XRF scanning also provides information about the materials used in the scanned objects, such as soft or hard plastics.

On the basis of the XRF results, we decided which SVHCs to further investigate in the laboratory: samples in which high amounts of bromine or antimony were found (> 500mg/kg) were tested for flame retardants and products made of PVC or other soft plastics for phthalates and short-chain chlorinated paraffins. In samples with lead contents above 0.04 %, we arranged an additional lead measurement in the laboratory.

Investigated substances:

|  |  |
| --- | --- |
| substance group | individual substances |
| phthalates | DEHP, BBP, DHNUP, DIHP, BMEP, DBP, DIBP, DNPP, DIPP, PIPP, DPP, DnHP, DHP, DCHP[[2]](#footnote-3) |
| flame retardants | Deca-BDE, HBCDD, TCEP[[3]](#footnote-4), trixylyl phosphate |
| chlorinated paraffins | SCCPs (short-chain chlorinated paraffines) |
| heavy metals | lead, tin, cadmium, chromium, boron |

The REACH Regulation stipulates that SVHC contents in articles exceeding 0.1 percent by mass must be reported. An "article" was defined in a judgment of the European Court of Justice as the smallest unit of an object. For example, it is not a bicycle that is regarded as an article, but each and every component of it. The limit value of 0.1 mass percent therefore refers to the leather of the saddle, the material of the handles, or the frame separately.

Therefore, the individual components of the purchased products were also examined in our test. For example, we had the plastic needles of a Christmas tree evaluated separately from the metal construction of the trunk.

Depending on their composition, the products were examined in individual measurements or in mixed samples. For example, in the case of a Christmas tree with green and brown needles, the two components were examined together; in the case of a tree with only white needles, they were analysed as a single sample. If more than 0.1 % SVHCs were found in a composite sample, the individual components were again subjected to a separate individual analysis in order to be able to make definitive quantitative statements.

When purchasing the articles, we scanned them with the Scan4Chem app and sent an SVHC request according to REACH Article 33 to the seller.

If we had not received any feedback from companies after 45 days on our SVHC request, we asked again by e-mail. If after another two weeks there was still no answer, the request was repeated.

**The tested substances**

Phthalates

Phthalates are so-called plasticizers. They are used to make plastics such as PVC supple.

The widespread use of phthalates is questionable because these chemicals have a similar effect to hormones. Some phthalates have been shown to be harmful to reproduction, such as diethylhexyl phthalate (DEHP), dibutyl phthalate (DBP), benzyl butyl phthalate (BBP) and diisobutyl phthalate (DIBP). In children, for example, they can interfere with sexual maturation. The exposure to hormone-like substances is also held responsible for the declining fertility of men, which has been observed in Europe for decades. For example, the plasticizers mentioned above show anti-androgenic effects such as reduced testosterone production or have a damaging effect on testicular function.

A study carried out by the Federal Environment Agency between 2003 and 2006, in which 1,790 children aged between 3 and 14 years were examined, revealed alarming results, particularly for plasticizers. Metabolites of the investigated plasticizers were found in the urine of almost all children, partly in considerable concentrations.

Because children often play on the floor, they increasingly absorb plasticizers via the house dust. Infants and young children also put everything in their mouths they can get their hands on. Through the saliva the phthalates can be dissolved and absorbed into the body. In addition, they enter the body mainly through food, but also through the air they breathe or through direct contact with the skin.

Countless everyday objects such as clothing, vinyl wallpaper, carpeting, shoe soles, imitation leather furniture, kitchen and bathroom articles or cables can contain phthalates.

Flame retardants

Since the 1970s, so-called flame retardants have been added to a variety of products. They are most frequently found in furniture, electronic products, construction and building materials and in vehicles. They are intended to reduce the flammability of products. Often brominated and chlorinated flame retardants or organophosphorus compounds are used.

However, it has been known for some time that many flame retardants are poorly degradable, accumulate in the environment and are toxic to humans and the environment. For these reasons, they are now detectable in air, soil, water, humans and animals. Various studies show a link between brominated flame retardants and thyroid cancer.

Due to their negative effects on humans and the environment, flame retardants have not only been classified as SVHCs, but also as persistent organic pollutants (POPs) according to the POP Regulation.

Chlorinated paraffins (SCCPs):

Depending on the chain length, chlorinated paraffins are divided into long-, medium- and short-chain chlorinated paraffins. The shorter the degree of interlinking, the more toxic (toxic) they are. SCCPs - short-chain chlorinated praffins - are used in a wide variety of applications, for example as plasticizers in plastics, as binders in paints, as flame retardants or as fatliquors for leather and furs.

Chlorinated paraffins are extremely durable and very toxic to aquatic animals. They pollute waters, soils and living organisms. SCCPs are classified by the International Agency for Research on Cancer as "potentially carcinogenic to humans". They can also cause kidney, liver and thyroid damage. Short-chain chlorinated paraffins accumulate in human fatty tissue and are passed on through breast milk. SCCPs are common all over the world and can be found in soils, waters, plants, humans and animals. They are regulated by the European Ordinance on Persistent Organic Pollutants (POP Ordinance), which sets a limit value of 0.15 percent.

Heavy metals

Heavy metals are metals whose density is higher than 5.0 g/cm³. Heavy metals and their compounds usually only occur in traces in nature. Many of them are vital for plants, animals and humans on the one hand, but on the other hand even minimal higher concentrations can often be harmful to health. Worldwide, some soils are heavily polluted with problematic heavy metals, which can in turn enter groundwater. Subsequently, they accumulate in plants, but also in the skeleton, liver, kidneys and red blood cells of animals and humans.

Some heavy metals and/or their compounds are carcinogenic, harmful to reproduction or have negative effects on our nervous system and organs such as kidneys and liver.

Heavy metals can be found in household items, jewellery and even toys.

**Results**

Detected substances (see table)

In half of the articles tested SVHCs were found in concentrations above 0.1 % (see table), thus these products are covered by the "right for information" according to Article 33 of the REACH Regulation.

Plasticizers above the 0.1% limit were found in 13 products, especially the phthalate DEHP. The front runners were two light chains, who contained up to a quarter of phthalates (24% and 27%). DEHP is also regulated in the European Electrical Products Regulation (RoHS), which states that articles with more than 0.1% DEHP may not be sold on the market. 6 of the light chains are therefore not marketable.

Short-chain chlorinated paraffins (SCCPs) were found in 13 products, 8 of which exceeded the 0.1% limit. SCCPs are also regulated in the globally applicable POP Regulation (POP = Persistent Organic Pollutant), which states that products with more than 0.15% SCCPs may not be sold. 4 Christmas trees and 4 light chains are therefore not allowed to be placed on the market either.

Flame retardants were detected in 3 Christmas balls above the 0,1% limit, in all 3 cases the substance Deca-BDE (decabromodiphenyl ether). This substance is regulated by both the POP and the RoHS regulations and articles with a content above 0.1% may not be placed on the market. This also means that the 3 balls are not allowed to be placed on the market.

Heavy metals were detected in only two products in small quantities.

Overall, almost 40% of the products examined are not marketable.

SVHCs content by article

In the artificial Christmas trees, SVHCs above 0,1% were found in more than 50 % of the samples, a quarter of all the trees are not marketable.

6 out of 7 tested light chains contained SVHC above 0,1 % and are also not marketable.

In 3 out of eleven Christmas balls SVHCs were found in concentrations above 0.1%. These 3 balls are not allowed on the market either.

Answers from the companies

Although more than 0.1% SVHCs were found in half of the articles examined and these products therefore fall under the „right for information“, we did not receive any information about SVHCs from any of the sellers of these articles.

Only one company - Spar - responded transparently that further research would have to be carried out. This subsequently led to an official product recall of the tree concerned. All the other companies had replied that the products in question did not contain SVHCs, but at our request most of them withdrew the products from the their shops.

In general, only three of the replies met the requirements of Article 33 REACH. Some companies answered that their products were "REACH compliant". However, this answer is misleading as SVHCs are allowed in products under REACH, but article 33 states that the seller must provide information to consumers. To limit the answer to "REACH conformity" is therefore insufficient information.

The manufacturer Globo, whose light chain contained 27 % DEHP plasticizer, even claimed to use "only ecological materials" for its products. Others referred to their suppliers, with whom we should get in touch. An Internet company - weihnachtsdekoration.at - sent us some test reports, for example about a flammability test of a black plastic mat, whereas we had asked for information about coloured Christmas balls. Some sellers even questioned the results of the accredited testing laboratory and from some companies we didnt receiv information at all (Otto and Universal) - even after three to five repeated inquiries.

The trendy furniture shop Suppan & Suppan even refused to sell us their products after we asked about hazardous substances in their articles. It was therefore not possible to test their products.

In general it can be said that there is a very low level of awareness about SVHC among companies. Answering consumer requests about SVHCs must become much more self-understood in the future.

**We demand, ...**

* that SVHCs in everyday products are replaced by safe alternatives as soon as possible. Substances of concern have no place in products of daily use.
* that the limit of 0.1% for endocrine disruptive substances is lowered. There is no safe limit for chemicals that interfere with the hormone system, as they can act even at lowest concentrations. We therefore call for these to be replaced as a matter of priority.
* that all potential hazardous substances are rapidly identified and evaluated and, where appropriate, added to the candidate list. There are still more than a thousand substances in circulation in the EU whose hazard potential has not been assessed.
* that for companies at every stage of the supply chain, the passing on of SVHCs information becomes self-understood and meets the requirements of REACH Article 33. Information on SVHCs must be disseminated both within the supply chain and to the competent authorities and ultimately made available to the public and consumers.
* that companies are made more aware of REACH requirements so that they are correctly implemented and supported by the authorities both in supply chain communication and in their substitution efforts.
* that the 45-day response period will be shortened and that sellers and manufacturers will have to respond to any SVHCs request, even if no SVHCs are included, in order to avoid misunderstandings.

**What can I do?**

* Enjoy your christmas time with a real Christmas tree from regional, organic cultivation.
* Use Christmas decorations made of natural materials such as wood, straw or glass.
* Prefer candles made of beeswax to light chains - of course only under appropriate precautions.
* Do not generally buy products made of soft PVC or cheap articles made of dark hard plastic and return strongly smelling plastic products to the retailer.
* Look out for eco-labels such as the Austrian Eco-label, the EU Eco-label or the Blue Angel.
* Scan products you want to buy in advance with the Scan4Chem app and send an SVHCs request to the seller or manufacturer of the item.
* Scan as many products as possible with the Scan4Chem app to show companies that consumers want safe products!

**The AskREACH project and the Scan4Chem app**

AskREACH is a five-year project funded by the EU LIFE programme. Under the coordination of the German Federal Environment Agency, GLOBAL 2000 is working together with 19 other partner organisations in 13 different EU countries to make REACH consumer law more widely known. As part of the project, we also developed the smartphone app "Scan4Chem", which allows consumers to scan the barcodes of products to see if they contain SVHCs. We also work with companies to make it easier for them to respond to SVHC requests. On the one hand we offer a database in which companies can register their products for faster response, on the other hand we support companies in supply chain communication. The Scan4Chem app can be downloaded for free in the app stores.

The contents of this report are the sole responsibility of GLOBAL 2000 and do not necessarily reflect the official opinion of the European Union or the supporters of the LIFE AskREACH project.

1. Gallen C, Banks A, Brandsma S, Baduel C, Thai P, Eaglesham G, Heffernan A, Leonards P, Bainton P and Mueller JF (2014) Towards development of a rapid and effective non-destructive testing strategy to identify brominated flame retardants in the plastics of consumer products, Science of the Total Environment 491-492: 255-265 [↑](#footnote-ref-2)
2. Di-(2ethylhexyl)-phthalate, butylbenzylphthalate, 1,2-benzenedicarboxylic acid di-C7-11, 1,2-benzenedicarboxylic acid di-C6-8, bis(2-methoxyethyl)phthalate, dibutylphthalate, di-iso-butylphthalate, Di-n-pentyl phthalate, diisopentyl phthalate, N-pentyl isopentyl phthalate, 1,2-benzenedicarboxylic acid dipentyl ester, di-n-hexyl phthalate, dihexyl phthalate, dicyclohexyl phthalate [↑](#footnote-ref-3)
3. Decabromodiphenyl ether, hexabromocyclododecane, tris(2-chloroethyl)-phosphate [↑](#footnote-ref-4)