Q&A – Chemicals in EURO 2012 shirts

What is at stake?

These days consumers are exposed to potentially hazardous chemicals from many sources, for example in the food we eat, the water we drink, the air we breathe, the cosmetics we apply to our skin and the textiles we wear. The combination of different chemicals coming together in our body from various sources can lead to a chemical cocktail effect. Moreover, some chemicals which are known to disturb our hormonal system could therefore already have negative impacts at very low levels.

As exposure to dangerous substances is a concern for consumer organisations across Europe, many comparative product tests focus on hazardous chemicals and give tips to consumers on how to lower their exposure. In addition, we call on policy makers to better protect consumers with stronger legislation and improvements in surveillance of the market.

What is the problem with the football shirts of the EURO 2012?

In May, three member organisations of BEUC (Altroconsumo in Italy, Organización de Consumidores y Usarios [OCU] in Spain and Associação Portuguesa para a Defesa do Consumidor [DECO] in Portugal) published the results of a series of laboratory tests for the chemical composition of nine national football shirts. The tests were conducted by Altroconsumo. The jerseys involved were those of France, Germany, Italy, Poland, Portugal, Russia, Spain, The Netherlands and Ukraine. The tests revealed that several chemicals were present which can be harmful for human health and the environment.

In order to produce the final combination of colour and print on the jerseys, hundreds of chemical compounds are used in the meshing of the fabrics. Some of these may be carcinogenic, impact negatively on the hormonal system, cause allergies or be harmful to the environment.

The risk increases particularly with sports jerseys as they are often used in summer, during perspiration inducing sporting activities and come into direct contact with the skin. Sweat and movement friction can facilitate the migration of hazardous substances from the fabric to our skin.

What findings were made?

Lead has been found in a majority of the samples (Germany, Spain, France, Russia, Italy, and Ukraine). Exposure to lead is a concern for public health as it can have a detrimental impact even at very low levels and no scientific safe limit values can be established1. Lead is a suspected cause of cancer and disturbance of the hormonal system. Exposure to lead can cause problems with kidneys, infertility, stillbirth, brain damage and negatively impact upon the development of the nervous system. Therefore, the exposure of consumers to lead needs to be the minimum technically possible. Lead levels were highest in the jerseys of Germany and Spain.

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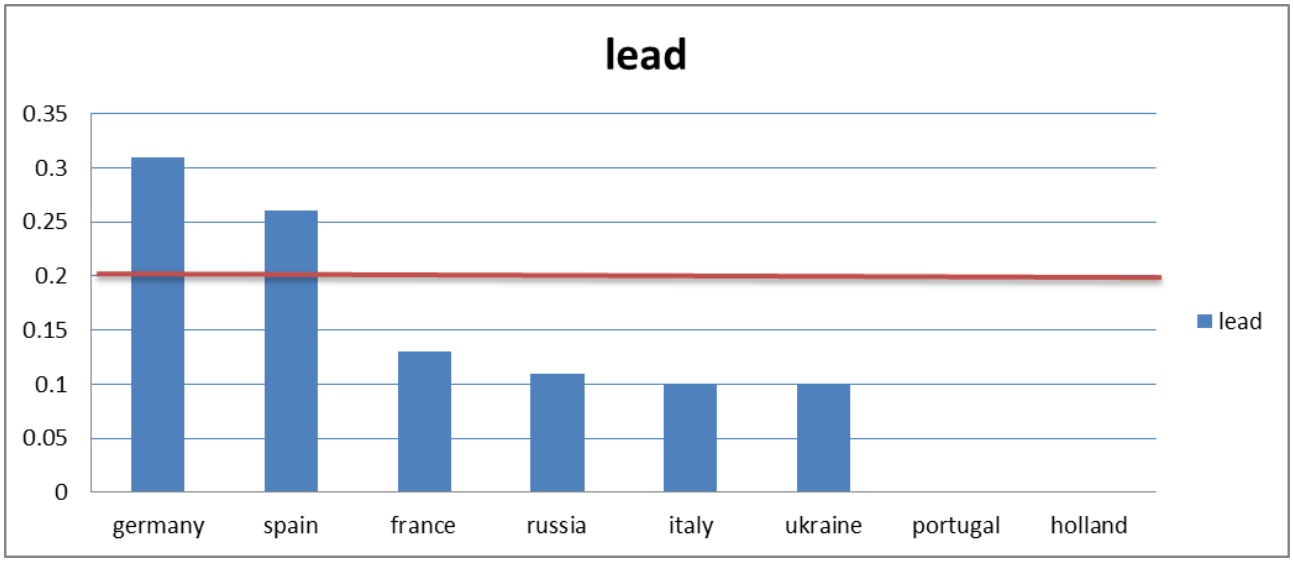
[1] See for example opinion of the German Federal Institute for Risk Assessment (BfR) on lead and cadmium in toys: '*Blei und Cadmium gehören nicht in Spielzeug*', Stellungnahme Nr. 048/2009 des BfR vom 1. Juni 2009, http://www.bfr.bund.de/cm/343/blei_und_cadmium_gehoeren_nicht_in_spielzeug.pdf



Graph: Levels of extractable lead are indicated in mg/kg. The red line indicates the level of lead which is allowed in Oeko-Tex 100 certified textile products for babies. For more information on the methods used, see section below 'What was the process employed?'

As the shirts of Portugal and The Netherlands were free of lead, this shows it is not necessary to be used and good manufacturing practice can avoid this unwanted substance.

Several shirts contained nickel (Ukraine, Spain, Germany, Portugal, The Netherlands, Poland) and one shirt contained chromium (France) which are both known to be sensitisers. Once people are sensitised, allergies can be triggered which will remain a life-long health concern. Therefore, prevention is the only option and exposure to nickel and chromium from textiles must be avoided, in particular when it comes to children.

One shirt (Germany) contained antimony which in combination with sweat can lead to skin dermatitis. Similar to antimony, lead, nickel and chromium are also prompted by sweat, thus there could be a risk for people wearing those jerseys.

The shirt from Poland contained organotin compounds which can be toxic for the nervous system, immunetoxic and have reprotoxic effects. It is also suspected of disturbing the hormonal system. The levels of Dibutyltin (DBT) exceed the limits defined in the Italian technical standard UNI/TR 11359:2010 and the 'Oeko-Tex 100' standard, a voluntary quality assurance and labelling scheme. As DBT is of serious concern, it should not be present in consumer textiles. The fact that only one shirt contained DBT shows that this substance can be avoided through good manufacturing practices.

In two shirts (Italy, Spain) nonylphenol ethoxylates (NPEs), which are very harmful to the aquatic environment, have been found. The REACH regulation restricts the use of nonylphenol and nonylphenol ethoxylates in the processing of textiles as it is prohibited by law to be released directly into wastewater. However, as nonylphenol is contained in the final product, these surfactants will still be released into wastewater streams once consumers wash the shirts at home and thereby negatively impact on the environment.

The jerseys have also been tested for the presence of the following substances, which were either below the level of detection or were present only in traces:

- flame retardants
- phthalates
- arsenic
- polycyclic aromatic hydrocarbons (PAHs)
- formaldehyde
- azocolorants and azodyes

What was the process employed?

Our members purchased official jerseys from 9 of the 16 competing nations and sent them to a specialised, independent laboratory for testing and analysis. The jerseys were tested for chemicals both in the fabrics and also the prints, i.e. the logos, numbers and names of the players.

They tested the chemicals in the shirts based on two technical standards UNI/TR 11359:2010 as well as Oeko-Tex.

Why are these jerseys on the market although they pose risks for human health and the environment?

The EU legislative framework is currently not strong enough to effectively protect consumers from hazardous chemicals for several reasons.

First, legal limit values for the maximum admissible amounts have not been established for all substances which can be found in consumer products. This usually makes it very difficult for national market surveillance authorities to take further action. For example, in the case of nonylphenol, the REACH Regulation only sets rules for the production process, but not the final product (see above).

Second, the legal limit values contained in the REACH Regulation are very often unsuitable to adequately protect consumers' health. For example in many cases the limit value is set at 0.1% of a chemical compared to the overall weight of the article. In absolute terms, this can be a lot (e.g. 0.1% of a chemical in a very heavy sofa). Moreover, when looking at the effect on human health, it is not only important to check the content of chemicals in an article but also which percentage of these chemicals can be released under certain conditions, a test which is not required by REACH.

Third, for some chemicals of concern such as lead, no legal limit values can be established based on the latest scientific findings[2], meaning their presence needs to be the minimum that is technically achievable. The REACH regulation only sets requirements for two forms of lead (lead carbonates and lead sulphates). In this jersey test, the REACH requirements on lead sulphates and lead carbonates have been met. However, the fact that the heavy metal of lead has been found in many shirts is a concern for consumer health.

Fourth, the EU regulatory system currently fails to take into account the chemical cocktail

[2] Ibidem

effect to which we are exposed when assessing the safety of chemicals, as it is mainly done based on a single substance approach. The presence of many different harmful substances demonstrates the need for the EU to bring a new approach to policy making which examines combined exposure to chemicals when carrying out risk assessment and management.

Finally, the EU regulatory system is currently unfit to adequately tackle chemicals which may negatively impact on our hormonal system (endocrine disrupters). Based on the latest scientific findings, it is assumed that some chemicals may already have a negative health impact in very low doses, in particular on the unborn child or babies[3].

Because the EU regulatory system currently does not provide sufficient protection for consumers, several technical standards and voluntary quality schemes have also been applied such as the UNI/TR 11359:2010 and the 'Oeko-Tex 100' standard which set more ambitious standards for the protection of consumers from harmful substances[4].

What should I do if I wear the jersey?

As the shirts come in direct contact with the skin, we advise consumers wash the shirts before using them. Moreover, consumers should wear cotton underneath the shirts when doing sport as this helps to prevent partially skin reactions due to the chemicals which may react with sweat.

Are all jerseys on the market concerned?

The football shirts were purchased in Italy but they are the official jerseys. Only the shirts of nine countries and for adults were tested. Thus, we cannot draw valid conclusions on the presence of chemicals in jerseys from other teams or jerseys produced in small sizes for children. Nor can we draw conclusions on other textiles on the market, from the companies that produce and distribute these jerseys or from other companies.

[3] Laura N. Vandenberg et al (2012): Hormones and Endocrine-Disrupting Chemicals: Low-Dose Effects and Nonmonotonic Dose Responses, in: Endocrine Reviews, June 2012, 33(3):0000-0000, http://edrv.endojournals.org/content/early/2012/03/14/er.2011-1050.full.pdf+html
Kortenkamp, Andreas et al (2012): State of the Art Report on Endocrine Disrupters, http://ec.europa.eu/environment/endocrine/documents/studies_en.htm

[4] UNI/TR 11359:2010 is a technical standard published by the Italian National Standards Body. The Oeko-Tex concept began in the 1990s based on independently developed test standards of the Austrian Textile Research Institute (ÖTI) and the Hohenstein Research Institute. It is administrated by the International Oeko-Tex® Association.