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Enforcement of green chemicals in products to minimize toxic and hazardous waste ~ Swedish Experience

(Short Background Paper for Plenary Session 7 of the Programme)

Final Draft

This background paper has been prepared by Ms. Karin Rumar, for the Seventh Regional 3R Forum in Asia and the Pacific. The views expressed herein are those of the author only and do not necessarily reflect the views of the United Nations.

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Short Background Paper

On

Enforcement of green chemicals in products to minimize toxic and hazardous waste ~ Swedish Experience

Karin Rumar
Senior Technical Officer,
Enforcement of chemicals in products
Swedish Chemicals Agency

Summary/abstract

Chemicals are found in almost all products and eventually in the waste when the products are scrapped. Today there is a lack of information concerning which hazardous substances can be found in products and therefore also in end-of-life products. The information available on chemicals content is rarely passed on from manufacturers and importers to the brand owners and users, and even more rarely to waste managers and recycling services.

While recycling is necessary and on the increase, there is a risk that hazardous substances are reintroduced into product life cycles making them a less safe choice.

One way of reducing the amount of hazardous substances in products is to have restrictions on substances in products. Some examples are given in this presentation.
Sweden have enforced chemicals in products for about 10 years. The experience is that forbidden substances are found even though legislation on restriction exists. Around 5-40 percentage of the investigated products contains restricted substances such as:

- Phtalates and short chained chloroparafins (SCCP) in soft plastic materials,
- lead in solders
- cadmium and lead in jewelry.

The following questions could be asked when trying to find a way forward to cleaner products and waste management:

1. What could be done to phase out dangerous substances in products to be able to get cleaner recycled products?
2. How can we find ways of getting the information flow of dangerous substances throughout the supply chain to work?

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1. Introduction

We are surrounded by chemicals in various forms, at home and at work. They are an integral part of our daily lives. There is hardly any industry where chemicals are not used, and they are used in a wide variety of products and processes. The number of products is increasing every year, and so are the volumes of chemical substances and mixtures.

Figure 1: shows a product's life cycle, exemplified by a cellphone, including design, production, sales, use, waste management and recycling.

Society's use of resources is growing rapidly. During the 1900s the extraction of material resources in the world increased approximately thirty-five times over. Today every EU citizen consumes on average about 16 tons of material per year, and throws away 6 tonnes per year.[1]

Figure 1 shows a life cycle where information on the chemicals involved is transferred between the various actors during the life cycle of the cellphone.

2. Hazardous substances in products

Today's products are more complex than they used to be and chemicals are used for numerous reasons. Chemicals are used in the manufacturing of materials, such as plastics and synthetic fibres, some chemicals are added to give materials and products specific functions or features, such as substances making surfaces water-repellent, plastics softeners, flame-retardants or dyes giving the material a desirable appearance. Products can also be coated with paints and varnishes. They may also contain residues of substances used in the manufacturing process but which no longer have a role to play, such as for example lubricating oils. This means that chemicals are found in almost all products and eventually in the waste when the products are scrapped.

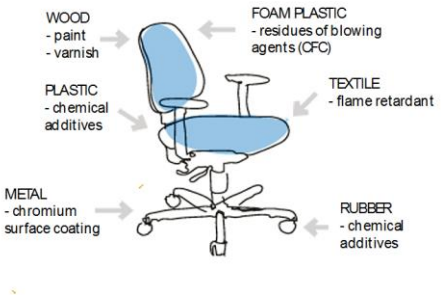

Figure 2: An office chair – it contains many components, materials and chemicals.

3. Gaps in information exchange

Today there is a lack of information concerning which hazardous substances can be found in products and therefore also in end-of-life products. The information available on chemicals content is rarely passed on from manufacturers and importers to the brand owners and users, and even more rarely to waste managers and recycling services.

[1] Roadmap to a Resource Efficient Europe, COM (2011) 571 final

The lack of information on chemicals in a product's life cycle makes it difficult to reuse materials from products in a safe way. An interview study conducted in Sweden shows that companies face difficulties in finding recycled material which meets their quality requirements.[2]

Figure 3: Loss of information on chemical content through the supply chain

4. Recycling of hazardous substances

While recycling is necessary and on the increase, there is a risk that hazardous substances are re-introduced into product life cycles if recycled materials are used without reflection on their chemical content. Hazardous chemicals may eventually end up in products where they should not be and thereby causing possible harm. This can potentially also weaken the market for recycled material, if there is cause for consumers to regard products made from recycled materials as being a less safe choice.

5. Chemicals in Products (CiP) Programme

The Chemicals in Products (CiP) Programme is a global programme for information on hazardous substances in products, that has been developed within the framework of the UN Strategic Approach to International Chemicals Management (SAICM).[3]

The CiP Programme is aimed at businesses, organizations and other stakeholders who are involved in a product's life cycle and are seeking to introduce improved and efficient procedures for the exchange of information on chemicals in products. The goal of the CiP Programme is that stakeholders have access to information on chemicals in products to assist them in making decisions and taking appropriate action on chemicals exposure, risk and management. Information on chemicals in products is a key to sustainable recycling.

6. EU regulation on chemicals in products

If we compare different product groups we find that chemicals in products are much less regulated than other chemical groups such as chemical products (substances and mixtures). As examples for chemical products there exist legislation such as classification & labelling, safety data sheets (information about danger, content, protection, waste, workplace etc.), restrictions and also registration of substances to the Echa (European chemicals agency). Pesticides are even more regulated since you need an approval from authorities to be able to sell pesticides.

[2] Material Recycling without Hazardous Substances – Experiences and future outlook of ten manufacturers of consumer products, PM 14/12, Swedish Chemicals Agency.

[3] http://www.unep.org/chemicalsandwaste/SAICM/ChemicalsinProductsCiP/tabid/56141/Default.aspx

The main regulation for chemicals in products are restrictions which exist in different EU legislation as you can see in the Figure 4. There are also examples of substances are restricted in these regulation. Reach has also an information duty where companies has to inform about any content of especially dangerous substances[4]

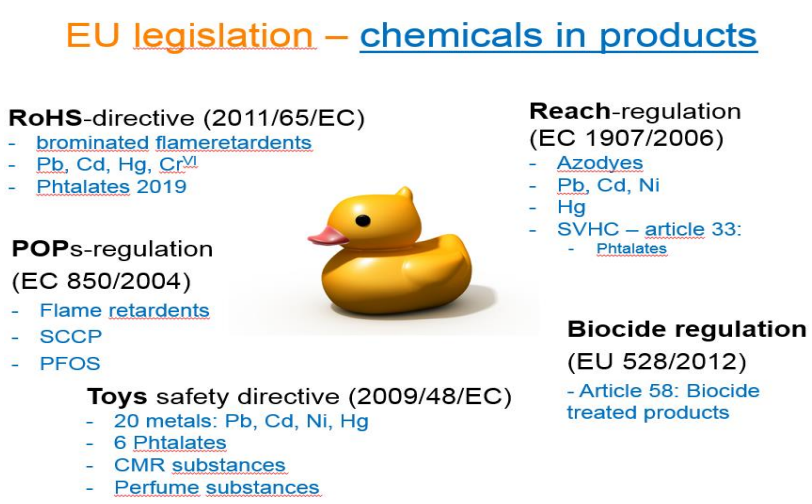

Figure 4: Examples of EU restrictions on chemicals in products

7. Enforcement strategy for chemicals in products

In Sweden we have had enforcement of legislation on substances in articles for approximately 10 years. We control mostly the manufacturers, and importers. We have an enforcement strategy for chemicals in products and focus areas are (actually the same as in the CiP project):

- Electric and electronic equipment
- Toys and other articles for children
- Construction articles and interior design articles
- Clothes, shoes and accessories

We (KemI) learnt from our experience that it is not enough to just check the required documentation such as CE label, technical documentation and EU Declaration of Conformity (DoC). Instead we have to perform chemical analyses on products.

We use our XRF analysing device (X-Ray Fluorescence). Mainly the metals can be found with this method. If the screening shows something we go on with external laboratories to verify our findings.

But most products do not contain restricted metals and we have to use our experience to find other substances. We look at soft plastic, cheap products, products that smell, and also at certain companies. Then we send in the products external laboratories that makes analyses.

[4] REACH requires suppliers to provide information to their customers if an article contains a substance listed on the Candidate List in a concentration exceeding 0.1 % weight/weight

8. Results - enforcement

Overall results from enforcement on restricted substances in products could be found in two reports - Enforcement 6/14[5] (in english) and Enforcement 1/16. In the latest report you could find the below results. Around 5-40 percentage of the investigated products have restricted substances. Cheap consumer products such as toys have higher percentage of fail.

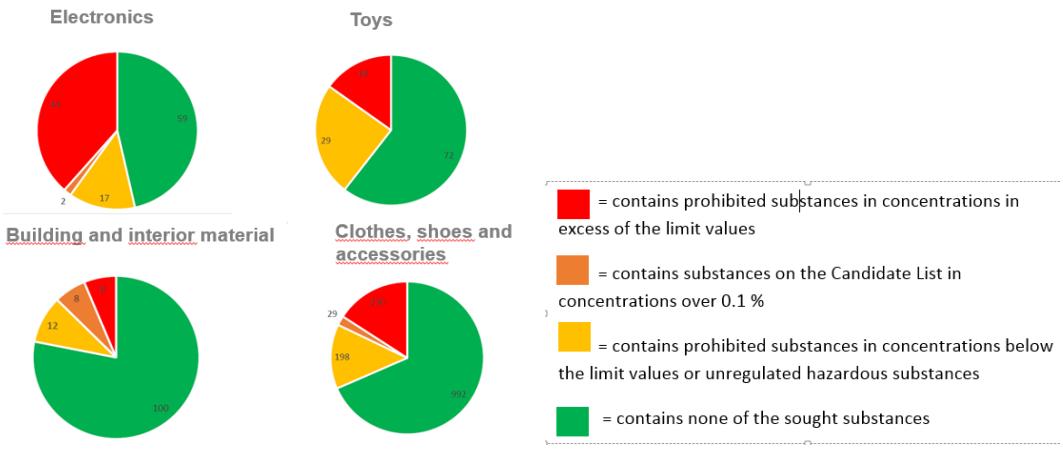

Figure 5 Results of enforcement in Sweden – analyses of restricted substances

Toys usually fails often on Pb (RoHS) in solders, phtalates and SCCP. Electrical usually fails on Pb (RoHS). Constructions material is lower because of higher demands on professional companies. Clothes, shoes, do not have as many restrictions as toys and electronics and lower amount of plastic material than for toys, which could be an explanation for the lower value. Recycled plastic material could contain phtalates since they are not restricted in other products than toys. SCCP is seen in all products types made of soft plastic, especially in electrical cords (25%).

9. Examples of hazardous substances found where they should not be

Brominated flame-retardants, banned internationally as Persistent Organic Pollutants (POPs), were detected in thermo cups and kitchen utensils on the European market due to the use of recycled plastic.

Inspectors in Sweden often find the following hazardous substances:

- Phthalates (for example, DEHP) in articles such as toys made of soft PVC plastic
- Short-chained chlorinated compounds (SCCP) in articles made of soft plastic (PVC)
- Lead in the solder in electrical articles
- Arylamines from azo dyes in textile
- Cadmium and lead in jewelry

Perfluorinated substances (PFAS, PFOA) have been detected in drinking water in a number of municipalities in Sweden.

Studies from the National Food Agency in Sweden show that breast milk and serum from the blood contain different types of pollutants. For banned or restricted substances the levels are

[5] http://www.kemi.se/global/tillsyns-pm/2014/tillsyn-6-14-analyses-2008-2013.pdf

slowly decreasing. Levels are however increasing for other substances, which have replaced the ones now banned. Mercury and PCBs, which have been restricted or banned nationally for a long time, are still being found.





10. Measures - enforcement

If the product contain exceeded levels of a restricted substances we have some measures that our authority can take. The company has to stop selling the product and they have to pay for the analytical cost. There could be penal provisions and environmental sanctions fees. We will also send in a report to Rapex[6]. RAPEX is a system used by the EU countries to exchange information about hazardous consumer products available on the market, which is also published on Rapex webpage.

11. Advice to companies

Our advice to companies is to be able to follow the regulation they have to take certain steps.

- Keep track on restricted substances.
- Written agreements with supplier is important.
- Specify legislation and restricted substances. It is not enough with just writing "Reach compliance".
- Do your own analyses on samples. It is very costly and inefficient to analyze everything. Therefore our advice is to investigate what materials you have in the product. From that you will have to get knowledge about what dangerous substances could be used in that kind of material.

12. What could consumers look for?

For consumers it is very hard to know if the product contain any restricted substances. Our advice is to ask the seller. Be especially aware on soft plastic, products that smell and have low price and quality. One could check if the CE label is there for toys and electronics and that the company´s name and address is on the products. It gives a hint if the company knows about the regulation.

13. The Way Forward

What could be a way forward in this aspect? The following questions could be discussed.

3. What could be done to phase out dangerous substances in products to be able to get cleaner recycled products?
4. How can we find ways of getting the information flow of dangerous substances throughout the supply chain to work?

[6] http://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts