TEST your environment!

Report

LITHUANIA
LATVIA
ESTONIA

Blood
Dust
Products
Indoor air

HAZARDOUS
substances
around us

THINK BEFORE YOU BUY

CHOOSE PRODUCTS WITH LESS HAZARDOUS SUBSTANCES

REPORT ON HAZARDOUS SUBSTANCES IN BLOOD, DUST, PRODUCTS AND INDOOR AIR IN LITHUANIA, ESTONIA AND LATVIA

Prepared by Baltic Environmental Forum Lithuania, Latvia and Estonia

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2015

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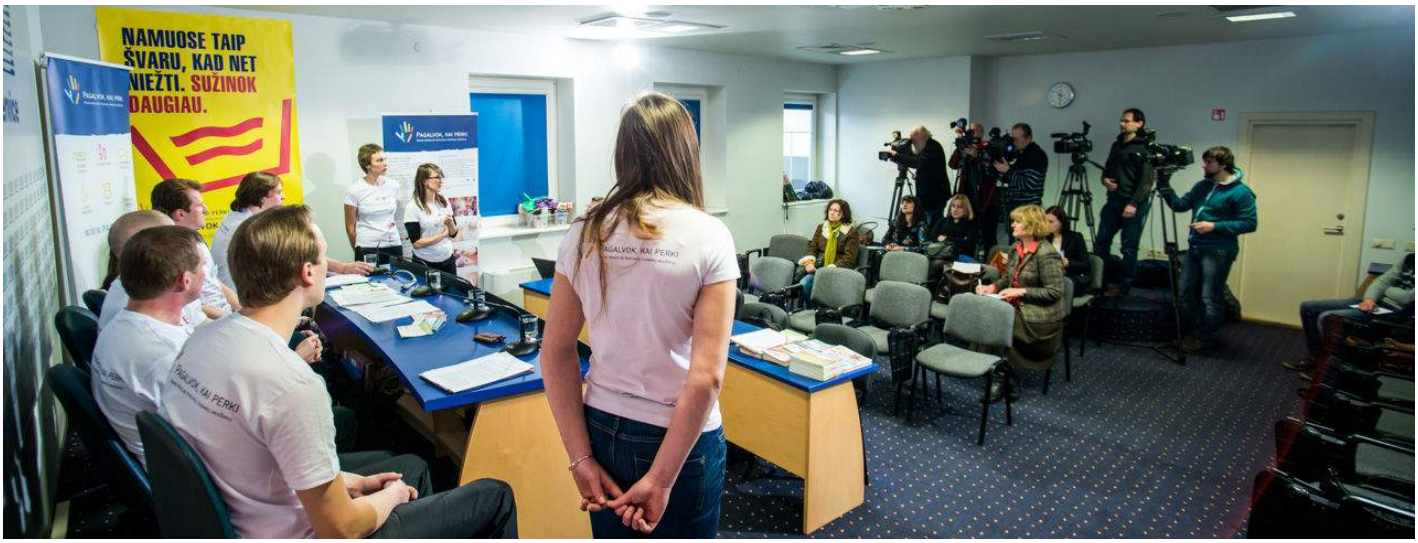

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Reciently, scientists and doctors start to speak very loudly about early age patients who suffer from endocrine, reproductive and immune system disruptions as well as cancer. New scientific studies reveal that this could be caused by our unhealthy environment and, moreover, it is us who make it such. In our everyday life we use variety of hazardous substances that are harmful to our environment as well as for our health withought even knowing that.

In our campaign "Think before you buy" we focus on substances which are of especially high concern because they may have negative impact on human health and environment, do not break down in the environment and therefore could occur in our food. Examples of such substances are flame-retardants (as polybrominated diphenyl ethers), perfluoro compounds used to provide stain resistance of anti-stick properties or substances used as plasticizers (as phthalates).

The individual amounts and concentrations of hazardous substances are normally very low and we don't feel that we are exposed. Although our knowledge on the potential effects of individual substances is increasing, we don't know what happens if they are combined and act together (chemical cocktail).

We have insufficient knowledge of the long-term effects of substances on our bodies: normally the studies are conducted to find out toxic effects with test animals and don't sufficiently well predict the effects for humans who are continuously exposed over their lifetime. There are some evidences that the continuous exposure to low levels of chemicals weakens the immune system, increases the incidents of allergies and affects reproduction of humans.

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The urgency need to reduce exposure to carcinogens in the environment is underlined by the U.S. President's Cancer Panel in Reducing Environmental Cancer Risk: What We Can Do Now (2010). Based on input from 45 oncology and cancer prevention experts, the panel concluded that environmental causes of cancer are "grossly underestimated" [1]. United Nations Environment Programme (UNEP) and World Health Organization (WHO) issued a report in February 2013 calling attention to recent spikes in rates of hormone-related cancers, and raising concerns about possible links to increased exposures to endocrine-disrupting chemicals (chemicals that mimic the effects of hormones) in consumer products [2]. We have little knowledge of which substances could disturb the hormone system and which doses would be hazardous to us. There are some evidence that they are very potent at very low concentrations or amounts. This raises a big concern for us that even those substances which direct adverse impact for human has not been shown, there is some evidence that such substances has impact for vital functions of animals [3] . In utero exposure to flame retardant chemicals, such as PBDEs, is associated with lower IQ and hyperactivity [4]. The UNEP and WHO report State of the Science of Endocrine-Disrupting Chemicals 2012 states that the breast is particularly vulnerable to exposure to cancer-causing chemicals during development in the womb [2]. This means that female children are born with a potentially higher risk of developing breast cancer later in life as a result of chemical exposures that took place during the mother's pregnancy, and persistent chemicals in the mother's system that she may have absorbed long before conception. And even more, it is already presented the evidence that endocrine disruptors have effects on male and female reproduction, breast development and cancer, prostate cancer, neuroendocrinology, thyroid, metabolism, obesity and cardiovascular endocrinology. Results from animal models, human clinical observations and epidemiological studies converge to implicate EDCs as a significant concern to public health [5].

Legislation does not provide sufficient protection against hazardous substances, because it can only react to threats AFTER they become known and only operates at the level of individual substances. Examinations of the European Union's REACH registry estimate the number of chemicals in commerce globally may be closer to 143,000 [6] . While some progress has been made in the regulation of toxic substances, there remain thousands of chemicals—which are possibly putting our health at risk—in our homes and workplaces that haven't been reviewed or have received screening level review with very limited data available to decision makers. Hence, the overall problems of combined exposures, continuous exposure to low doses and the concerns related to environmental damage and endocrine disruption may not be sufficiently addressed. Also the enforcement of existing legislation cannot ensure that all prohibited or restricted substances are actually absent in all products on the market.

The term "hazardous chemicals" refers to substances that could cause harm to human health and environment. Some chemicals may cause acute hazards to humans, e.g. be toxic (poisonous), cause allergies or irritate the skin. Others may have negative impact in the time perspective , e.g. may cause or promote the development of cancer, fertility problems, make damage to immune system.

INTRODUC

CAMPAIGN

OUR Baltic Environmental Forum (BEF) Group decided to show for the citizens of 3 Baltic states (Lithuania, Latvia, Estonia) how the environment they are living in and their own body looks like for real. We have made 4 different tests – products (in Lithuania, Latvia and Estonia), dust (in Lithuania), indoor air (in Latvia) and blood (in Lithuania and Estonia). Some of most commonly used hazardous substances (phthalates, polibromynated diphenyl ethers and perfluorinated substances and several others) were checked. Results showed that dangerous chemicals are all around Lithuanians, Latvians and Estonians; and there are a lot of to do in order to eliminate them from their life. Now they know, so what to do next?

Untill such substances are not banned for use in everyday products it would be great if we could avoid such hazardous substances by reading the labels and relying on certified eco-labels. Products, that contain for example flame retardants, do not have an obligation to itemize the full product composition on the labels. Additionally, it seems that by banning hazardous substance the problem is solved, but to phase out that substance from products usually takes several years. This means it takes more time until the hazardous substance is really eliminated from the market.

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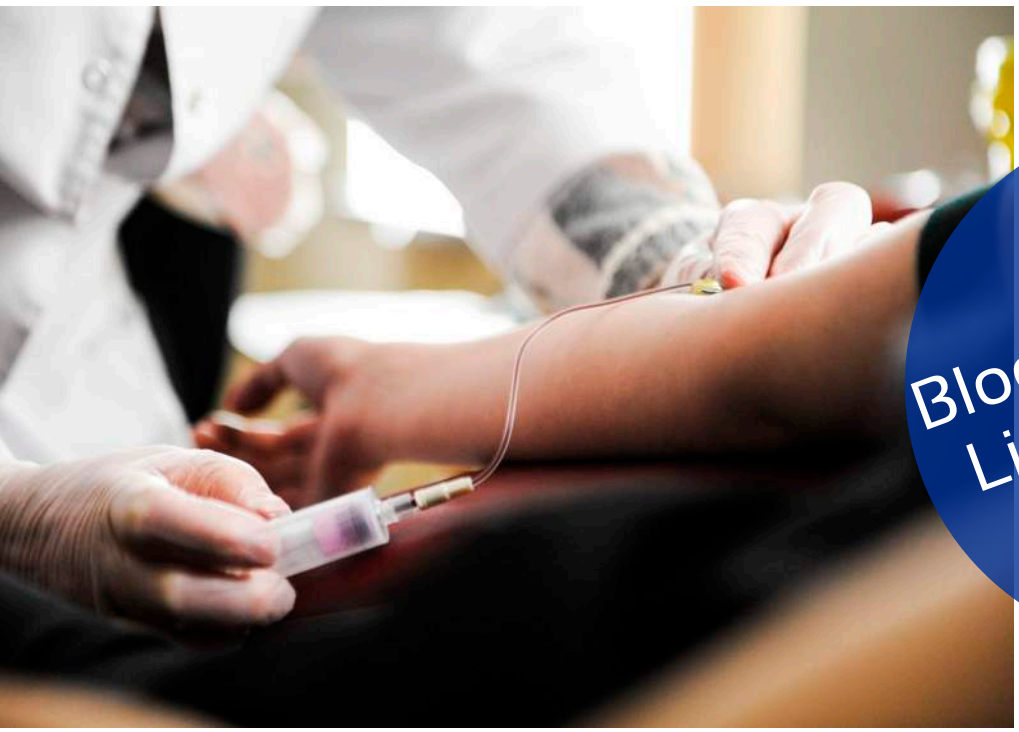
THINK BEFORE YOU BUY
CHOOSE PRODUCTS WITH LESS HAZARDOUS SUBSTANCES



Blood testing in Lithuania and Estonia

Another issue – it takes more time until the same hazardous substances are removed from the products as impurities (for example there is still found lead in cosmetics) [7]. You cannot avoid it if you do not know what is in the product. We advise to ask the retailer/importer/ producer about presence of hazardous substances in the articles before buying the product.

This report present detailed test results and reccommendations what different stakeholders and every citizen should do on the purpose to avoid hazardous substances in everyday life.

4 DIFFERENT TESTINGS:

BLOOD, DUST, PRODUCTS AND INDOOR AIR

We made analysis of blood samples of 20 volunteers for phthalates, polybrominated diphenyl ethers and perfluorinated compounds, dust samples from 7 houses for the same substances, 15 indoor air samples from nurseries for volatile organic compounds and 78 products for phthalates, 36 wooden articles for formaldehyde, 25 plastic articles for formamide, 101 toy for heavy metals, 7 women sanitary pads for phthalates and volatile organic compounds.

1. OUR AIM AND WHAT WE DID

There already have been conducted more than 20 similar campaigns all over the world since year 2003. We decided to make tests of small sample size and to take the variety of matrixes in wich different hazardous substances can occure. Even if our tests are not scientific it is still at least some real facts about hazardous substances in our surrounding and body because in Lithuania, Latvia and Estonia there are no national testing of air, bio monitoring etc. So we used a very broad approach starting from environment and ending with products. We wanted to illustrate, that same hazardous substances, if they are once put into the article, later can migrate to the indoor air and finally occurs in our body. Our main goal is to encourage industry to reduce the use of hazardous substances in production, work together with institutional organizations for ensuring appropriate and greater attention for chemical substance regulation and enforcement issues, informing society about hazardous substances burden for our bodies and possible alternatives.

ACCREDITED LABAROTORIES

Testing samples were sent to accredited laboratories – national laboratories (products, air) and abroad (blood, dust, products). 7 different laboratories were chosen, because not all of them have methods for those types of samples. Also, such factors as price and competence making similar researches were considered.

Blood tests were conducted by the TNO laboratory in the Netherlands (Netherlands Organisation for applied scientific research TNO),

dust samples were sent to Eurofins laboratory in Sweden,

cosmetic product tests was carried out by German laboratory PiCA (PiCA Prüfinstitut Chemische Analytik GmbH).

Products from Lithuanian market were tested in Lithuania, in National public health care laboratory.

Products from Estonian market were tested in Central Chemical Laboratory of Health Board.

Indoor air analysis was performed in Latvian laboratory "Vides Audits" and product tests for formaldehyde content in Latvian laboratory "LatSert".

2. SUBSTANCES OF OUR CONCERN

Polybrominated diphenyl ethers, Perfluorinated compounds, Phtalates

We have selected for testing several groups of hazardous substances. **In blood and dust** we have looked for substances which are used very widely in producing of different groups of products and usually has additional function, like phthalates are the ones who makes plastic softer, polybrominated diphenyl ethers slows down the moment of ignition and perfluorinated compounds makes our pans non sticky. Also these substances are widely discussed in scientific community and for regulatory purposes, because of their long term negative impact on human health and environment. Studies are also showing that these hazardous chemicals are ending up in the natural environment, polluting rivers and lakes, finally ending up in drinking water [8]. Substances released to the environment can hardly be "taken back" and may remain there over long periods of time. Some of them may disturb eco-systems and/or accumulate in the food chain and after all end-up on our plates. We have investigated that these additional functions can be achieved with alternative substances and products are already on the market in Baltic States.

At greater extent **in products** we have tested only phthalates because these substances have a lot of functions (from plasticizers in toys and construction materials to scent carriers in perfume). We wanted to test if they can be widely found in different products that are present in our market.

HAZARDOUS SUBSTANCES THAT WERE TESTED IN BLOOD AND DUST

Substances	Abbreviation	Use	Impact	Legal status	Testing matrix
Phthalates					
Dimethyl phthalate	DMP	Used as plastic softeners and often found in products of polyvinyl chloride (PVC), e.g. flooring, shower curtains, even toys, also in cosmetic where used in synthetic fragrances. [10]	Phthalates are considered to be endocrine disruptors because of their complex effects on several hormonal systems including the estrogen and androgen hormone systems. Some phthalates, including butyl benzyl phthalate (BBP) and di-n-butyl phthalate (DBP), act as weak estrogens in cell culture systems. They can bind to estrogen receptors (ER), induce estrogen-appropriate cellular responses and act additively with estradiol in altering these systems. Phthalates also bind weakly to the androgen receptor (AR), disrupting the cellular actions ordinarily initiated by the androgens. Those that bind most strongly to the AR, and therefore might be expected to exert the greatest effects through this pathway, include DBP, di-i-butyl phthalate (DiBP) and butyl benzyl phthalate (BBP).[9]	For some of phthalates there is restriction to use them in toys and child care articles in EU and some other countries. DEHP, BBP, and DBP are restricted for all toys; DINP, DIDP, and DNOP are restricted only in toys that can be taken into the mouth. Nevertheless for majority of other consumer products no restrictions exist.	Blood, dust, products, indoor air
Diethyl phthalate	DEP				
Diisobutyl phthalate	DIBP				
Dibutyl phthalate	DBP				
Butylbenzyl phthalate	BBP				
Dicyclohexyl phthalate	DCHP				
Bis (2-n-ethylhexyl) phthalate	DEHP				
Difenyl phthalate	DPP				
Di-n-octyl phthalate	DOP				
Diisononyl phthalate	DINP				
Diisodecyl phthalate	DIDP				
Di-n-nonyl phthalate	DNOP				
Bis (2-ethylhexyl) adipate	DEHA				
Polybrominated diphenylethers					
Tetrabromobisphenol-A	TBBA	Organobromine compounds that are used as flame retardant. Like other brominated flame retardants, PBDEs have been used in a wide array of products, including building materials, electronics, furnishings, motor vehicles, airplanes, plastics, polyurethane foam, and textiles. [12]	PBDEs are likely to be thyroid hormone disruptors, neurodevelopmental deficits raisers and cancerogenes. Available evidence suggests that the PBDE congeners likely to bioaccumulate (i.e., those observed in human tissues and other biota) have the propensity to disrupt thyroid hormones, cause neurobehavioral deficits and possibly cause cancer in laboratory animals. [11]	Prohibition of manufacture BDE 47-183 applies in many countries (which signed Stockholm Convention), as well as a ban on production and use in the EU (since 2004). For other compounds there is no such ban.	Blood, dust
Hexabromo cyclododecane	HBCD				
2,2',4-Tribromo diphenylether	BDE-17				
2,2',4-Tribromo diphenylether	BDE-28				
2,2',4,4'-Tetrabromo diphenylether	BDE-47				
2,2',4,5'-Tetrabromo diphenylether	BDE-49				
2,2',3,4,4'-Pentabromo diphenylether	BDE-85				
2,2',4,4',5-Pentabromo diphenylether	BDE-99				
2,2',4,4',6-Pentabromo diphenylether	BDE-100				
2,2',4,4',5,5'-hexabromo diphenylether	BDE-153				
2,2',4,4',5,6'-Hexabromo diphenylether	BDE-154				
2,2',3,4,4',5',6-Heptabromo diphenylether	BDE-183				
Decabromo diphenylether	BDE-209				
Perfluoro compounds					
Perfluorooctane sulphonate	PFOS	Substances that provide products such properties as resistance to high temperature, water and grease. Used in grease resistant food packaging paper, carpets or impregnated clothing, cookware (e.g., Teflon pans).[14]	These are persistent, accumulating in organisms and toxic substances, which affects the body's endocrine system. Animal studies show negative effects on the liver, thyroid, reproductive system. [13]	The EU has restrictions on the use of PFOS in articles (up to 0.005% by weight), as well as in textiles and treated surfaces concentration should not exceed 1 µg/m^2. For PFOA there are no analogous restrictions.	Blood, dust
Perfluorooctanoic acid	PFOA				

These substances enter to our body from the very first beggining – they are being found in newborn childrens blood [15], in our environment [8], in our food [16] and in our home dust [17].

2. SUBSTANCES OF OUR CONCERN

Heavy metals

The body needs a certain amount of metals to function properly. But toxic heavy metals work differently, accumulating in the body and inhibiting normal, healthy processes. This can cause illness in people exposed to high amounts. It is prohibited to use heavy metals on purpose in producing of wide variety of products, but it is still allowed small concentrations of heavy metals even in toys. They are as impurities.

Lead is the best known heavy metal. Children react more negatively than adults to lead exposure. In children, lead is a potent neurotoxin. It damages the developing brain, and can continually affect behavior and cognitive ability into adulthood.

There were preliminary tested 100 toys in Lithuania for heavy metals with X-ray Fluorescence analyzer with purpose to show that heavy metals are still in our children's products and more, they are allowed by legislation. 5 of these toys in Lithuania and 1 toy in Estonia were taken for laboratory analysis to check if the legally allowed limits are not exceeded.

HEAVY METALS THAT WERE TESTED IN TOYS

Hazardous chemical	Possible health effects	Uses	Used in toys
Cadmium	Carcinogenic, toxic by inhalation, impairs fertility, disrupts development of children's brains	Dyes and pigments: create the red, orange, and yellow pigments	Dolls, wooden toys, plastic
Chromium	Carcinogenic, mutagenic, toxic: causes severe burns, impairs fertility.	Dyes and pigments: create the green, orange, and yellow pigments	Dolls, cuddly toys, wooden toys, electronic toys
Lead	Carcinogenic and impairs fertility. Effects on the developing brain	Dyes and pigments: create the red, orange, and yellow pigments	Dolls, wooden toys, plastic, electronic toys

2. SUBSTANCES OF OUR CONCERN

Volatile organic compounds

Indoor air was tested for allergenic fragrances (e.g. limonene, pinene) and other volatile organic compounds (VOCs). Volatile organic compounds are chemicals used for manufacture and maintain building materials, interior furnishing, cleaning products and personal care products. "Volatile" means that these chemicals evaporate or can easily get into the air at room temperature. There may be from 50 to hundreds of individual VOCs in the indoor air at any time. Some may produce objectionable odors at very low levels, but many others have no noticeable smell. Many VOCs are irritants and can cause headaches, eye, nose and throat irritation and dizziness. Long-term exposure to certain VOCs may lead to chronic diseases or cancer. At high concentrations, some VOCs are toxic.

Several VOCs were tested also i**n articles** made from soft plastic, glued wood and women sanitary pads, as these substances are usually announced as "substances to be avoided" in products of this kind.

Formamide is classified as category 1b reprotoxic substance, warning that it may cause harm to the unborn child. Studies in animals have shown that it has a negative effect on fertility, the circulatory system, is toxic to the fetus and cause damage to the unborn child. France introduced stricter limit for formamide, after revealing high concentration of formamide in several soft puzzles. The limit is still in force and allows no more than 200 mg/kg formamide in children's puzzles. French responsible authorities were not certain that the EU limits adequately protect young children from the risk of hematological diseases.

Formamide is quite volatile therefore children and adults mostly get into contact with it via inhalation. However, it may get into the body through the skin or orally if a child chews contaminated toy.

VOLATILE ORGANIC COMPOUNDS THAT WERE TESTED IN AIR AND PRODUCTS

Substance group	Tested substances
Aldehydes	Formaldehyde
Alcohols	Methanol, ethanol, butanol, isopropanol, propanol, isobutanol
Amides	Formamide
Aromatic hydrocarbons	Toluene, ethyl benzene, m-,p-xylene, styrene, o-xylene
Carbonyls	Butyl acetate, acetone, ethyl acetate, methyl ethyl ketone
Chlorinated hydrocarbons	Tetrachlorethylene, 1,2-dichloroethane
Ethylen glycoles	Ethyl cellosolve
Nitriles	Acetonitrile
Terpenes	α-pinene, limonene, linalool

3. TESTS AND RESULTS

Four different tests matrixes of hazardous substances were chosen – products, indoor air, dust and blood. With this we want to show that hazardous substances if they are put into the products later migrate into the indoor air and dust and finally occur in our body. We have tested blood samples of 20 volunteers for phthalates, polybrominated biphenyl ethers and perfluorinated compounds, dust samples of 7 houses for the same substances, 15 indoor air samples of nurseries for volatile organic compounds very commonly used in construction materials, 79 products for phthalates and 36 wooden articles for formaldehyde, 25 plastic articles for formamide, 100 toys for heavy metals, 7 women sanitary pads for phthalates and volatile organic compounds.

3.1 HAZARDOU IN PRODUCTS

Hazardous substances make problem because of their widespread use in articles which people use every day. Because these substances are semi volatile and can migrate from product into air, settle down on the dust and later be inhaled or get into the body with food such substances potentially makes hazard for our health. Products in which hazardous substances are included for their additional properties are the first in the life cycle that causes problems.

S SUBSTANCES

HOW TESTING WAS ORGANISED?

1

In summer 2013 various products were selected for phthalate testing in Lithuania. Baltic Environmental Forum Lithuania and National Non-Food Products Inspectorate cooperated in selection of products. 67 products (dolls, shower curtains, wallpaper, nail polish, perfume and etc.) were chosen from supermarkets and shops in Lithuania.

2

Following the results from air tests in Latvia in 2014, 36 wooden products were also tested for formaldehyde content. The products were bought in regular supermarkets and chosen on basis to be likely found in an ordinary household (e.g. MDF boards, glued wooden flooring materials, etc.) or to be present in a nursery room (e.g. rocking horse).

3

In year 2015 there were additionally tested:
- in Estonia 11 plastic toys for phthalates and 1 for heavy metals;
- in Latvia 25 ethylene vinyl acetate products for formamide;
- in Lithuania 100 plastic toys for heavy metals detection with X-ray Fluorescence analyzer, and 5 of them for heavy metals limits detection in article sent to laboratory;
- in Lithuania 7 different women sanitary pads for phthalates and volatile organic compounds.

4

Cosmetic product tests were carried out by German laboratory PiCA, other products from Lithuania were tested in Lithuania, in National public health care laboratory, products for formaldehyde and formamide content in Latvia were tested in laboratory "LatSert", products in Estonia were tested in Central Chemical Laboratory of Health Board.

RESULTS

PHTHALATES IN PLASTIC PRODUCTS & IN COSMETICS

In 2013 in Lithuania new articles taken from the shops were tested for the phthalates. With the help of The State Non Food Products Inspectorate under the Ministry of Economy were selected 52 soft plastic articles and 15 cosmetic products.

Most of tested articles are made from soft plastic polyvinyl chloride (PVC): shower curtains, gym balls, plastic shoes, dolls, water toys, vinyl wallpapers, plastic tablecloths. Also were tested cosmetic products: nail polish and perfume.

In 2015 in Estonia 11 samples of toys (colored bath ducks, rubber ball, loom band, dolls, bath toys, bath book, puzzle mat) were taken from supermarkets in cooperation with inspectors of Health Board.

In 2015 in Lithuania additional testing of women sanitary pads for phthalates was made. 7 different products (5 cheapest and most popular and 2 advertised as healthy and ecological) for testing were chosen by project team and bought at supermarket.

Almost in 40% of products tested in 2013 in Lithuania concentration of phthalates was higher than 0.1% its weight. Worrying facts is that in 6 out of 10 dolls, phthalate concentration exceeds the legal limit (0.1% its weight) from 191 to 322 times. These dolls with the help of National Non-Food Products Inspectorate have already been removed from the market and reported to RAPEX (EU Rapid alert system).

Phthalates can be used in cosmetics, but their amount is very limited. It is allowed to use diethyl phthalate (DEP) which makes the function of solvent or smell "carrier" in perfumes. In three cosmetic products from Lithuanian market tested in year 2013 these hazardous substances were detected.

Our investigation also have shown, that there are still products with prohibited substances on the market: dibutyl phthalate (DBP) was detected in one nail polish and diethyl phthalate (DEP) was found in 2 perfumes. One of those perfumes is for children.

When selecting products various criteria were taken into account: price, country of origin, variety of shopping centers, region where the shopping center is located (the goal was to cover all regions of Lithuania). We have selected products that have some phthalate use restrictions e.g. toys and cosmetics. They were selected by National Non-Food Products Inspectorate. We also selected some regular products where phthalates can be used.

RESULTS OF PRODUCT TESTING FO

Product	Nr.	Place of purchase	Price, Lt	Country of origin	Analysed substances				
					Benzylbutyl phthalate (BBP), %	Di-2-etylhexyl phthalate (DEHP), %	Di-n-octil phthalate (DNOP), %	Dibutyl phthalate (DBP), %	Diisononyl phthalate, Diisodecyl phthalate (DINP+DIDP), %
Shower curtains	1	Maxima, Vilnius	6,99	China	<0.0005	0,0724	<0.00025	<0.00025	<0.0025
	2	Jysk, Vilnius	9,99	China	<0.0005	<0.00025	<0.00025	0,0029	<0.0025
	3	Jysk, Vilnius	6,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	4	Jysk, Vilnius	14,99	P.R.C	0,0047	0,0048	<0.00025	<0.00025	<0.0025
	5	Jysk, Vilnius	3,99	China	0,003	0,0074	<0.00025	<0.00025	<0.0025
	6	Thomas Phillips, Vilnius	10,75	Germny	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	7	Bery baldai (SBA), Vilnius	29,99	-	<0.0005	0,0066	<0.00025	<0.00025	<0.0025
Vinyl wallpaper	1	Senukai, Vilnius	31,92	EU (France)	<0.0005	0,0077	<0.00025	<0.00025	<0.0025
	2	Senukai, Vilnius	25,74	EU (Belgium)	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	3	Senukai, Vilnius	23,94	Ukrain	<0.0005	**3,724**	<0.00025	<0.00025	<0.0025
	4	IRIS, Vilnius	16,73	Italy	<0.0005	<0.00025	<0.00025	<0.00025	**6,81**
	5	Ermitažas, Vilnius	34,99	Germany	<0.0005	<0.00025	<0.00025	<0.00025	**8,34**
Gymnatsic balls	1	Senukai, Vilnius	34,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	2	Norfa, Vilnius		China	<0.0005	**16,1**	<0.00025	<0.00025	<0.0025
	3	Ermitažas, Vilnius	44,99	-	<0.0005	**0,119**	<0.00025	<0.00025	0,014
	4	Maxima, Vilnius	34,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	5	WinnerSport, Vilnius	95	Italy	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
Dolls	1	UAB "Sanitex", Panevėžys	-	China	<0.008	**32,1**	<0.008	<0.008	0,026
	2	UAB "Sanitex", Panevėžys	-	China	<0.008	**31**	<0.008	<0.008	<0.026
	3	UAB "Sanitex", Panevėžys	-	China	<0.008	**19,1**	<0.008	<0.008	<0.026
	4	UAB "Utenos prekyba", Utena	18,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	5	Maxima, Vilnius	16,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	6	UAB "Utenos prekyba", Utena	14,39	China	<0.0005	**23,1**	<0.00025	<0.00025	<0.0025

R PHTHALATES IN 2013 IN LITHUANIA

Product	Nr.	Place of purchase	Price, Lt	Country of origin	Analysed substances				
					Benzylbutyl phthalate (BBP), %	Di-2-etylhexyl phthalate (DEHP), %	Di-n-octil phthalate (DNOP), %	Dibutyl phthalate (DBP), %	Diisononyl phthalate, Diisodecyl phthalate (DINP+DIDP), %
	7	Maxima, Vilnius	19,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	8	Senukai, Kaunas	25,9	China	<0.0005	**25,1**	<0.00025	<0.00025	<0.0025
	9	Martina, Klaipėda	4,79	China	<0.0005	**27,7**	<0.00025	<0.00025	<0.0025
	10	Martina, Klaipėda	14,39	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
Water toys	1	Prisma, Vilnius	5,99	-	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	2	Ij Gustina, Tauragė	18	Germany	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	3	Ij Gustina, Tauragė	39	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	4	IKI, Klaipėda	16,99	China	0,0029	<0.00025	<0.00025	<0.00025	<0.0025
	5	Senukai,Panevėžys	5,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	6	UAB Norfos mažmena, Panevėžys	5,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	7	Senukai, Panevėžys	4,99	Honkong	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	8	UAB Norfos mažmena, Panevėžys	5,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	9	Senukai, Panevėžys	4,99	Honkong	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	10	UAB Norfos mažmena, Panevėžys	3,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
Plastic sandals	1	Senukai, Vilnius	23,49	China	0,0372	0,0064	<0.00025	<0.00025	<0.0025
	2	Norfa, Vilnius	16,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	3	Batų kalnas, Vilnius	35,99	Italy	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	4	Batų kalnas,Vilnius	15,99	Italy	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	5	Norfa, Vilnius	12,99	China	<0.0005	0,82	<0.00025	<0.00025	0,589
Plastic tablecloths	1	RIMI, Vilnius	19,99	China	<0.008	**12,9**	<0.008	<0.008	<0.026
	2	Senukai, Vilnius	10,6	Poland	<0.0005	0,0259	<0.00025	<0.00025	<0.0025
	3	Senukai, Vilnius	9,45	Poland	<0.0005	0,0961	<0.00025	<0.00025	<0.0025
	4	Senukai, Vilnius	6,21	Turkey	<0.0005	0,0403	<0.00025	<0.00025	<0.0025
	5	Maxima, Vilnius	3,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	6	Maxima, Vilnius	5,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	7	Maxima, Vilnius	8,99	Greece	<0.0005	0,0074	<0.00025	<0.00025	<0.0025
	8	Thomas Phillips, Vilnius	14,93	Germany	<0.0005	**13,4**	<0.00025	<0.00025	<0.0025
	9	Thomas Phillips, Vilnius	11,03	Germany	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025
	10	JYSK, Vilnius	7,99	China	<0.0005	<0.00025	<0.00025	<0.00025	<0.0025

RESULTS
PHTHALATES IN TOYS

In 2015 in Estonia children's plastic toys - coloured bath ducks, rubber ball, Loom Band, 2 dolls, bath toys, bath book, puzzle mat and LEGO toy - were tested.

Phthalates (DNOP, DIDP, DINP, DBP, BBP, DEHP) were not found above the existing concentration limits (0,1 % w/w) in toys,

RESULTS
HEAVY METALS IN TOYS

In 12 toys from 100 heavy metal (lead) traces detected, 5 of them were sent to laboratory for detection of lead quantity.

Legally binding limits were not violated. But we are still concerned, that producers do not eliminate these substances from toys.

Most contaminated with lead were toys:

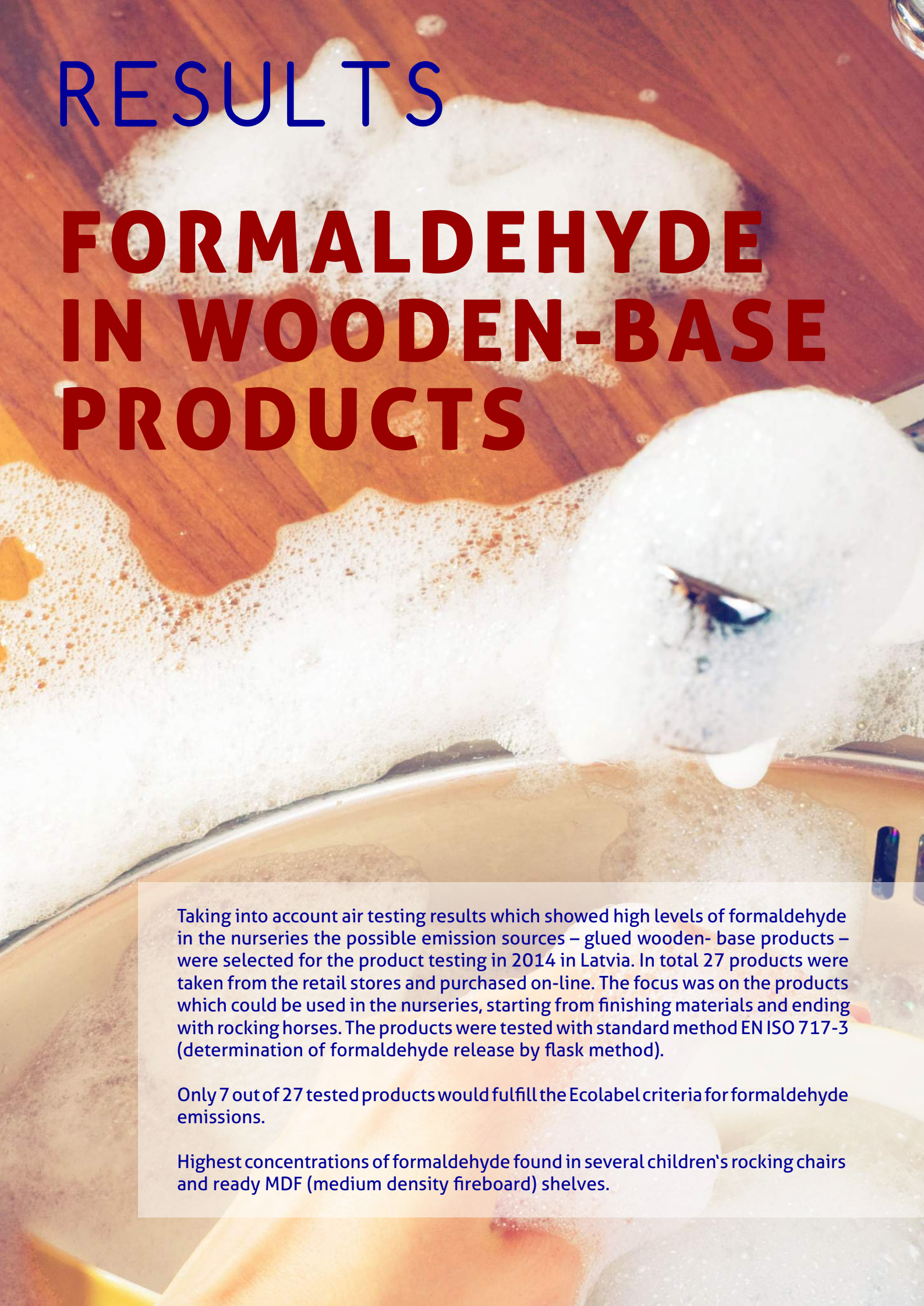
- cheaper than 5 Eur;
- produced in China;
- made from plastic of yellow color.
- metal cars painted in different colors.

RESULTS
PHTHALATES IN WOMEN SANITARY PADS

Women sanitary pads of 7 different kinds - Ultra Thin Pads with Wings (Optima), Always Ultra (Standard), Always Sensitive (Ultra normal plus), Perfect Ultra Green (Bella), Ultra Camomile derma crem (Naturella), Pantiliners with Far-IR Anion Strip (Gentle Day), Lady Anion (Incontinency pads) - were tested in Lithuania in 2015 .

Theconcentration of phthalates was measured in the whole product. For laboratory testing gas chromatography method was used.

Phthalates (DNOP, DIDP, DINP, DBP, BBP, DEHP) in women sanitary pads were not found above detection limit.



RESULTS

FORMALDEHYDE IN WOODEN-BASE PRODUCTS

Taking into account air testing results which showed high levels of formaldehyde in the nurseries the possible emission sources – glued wooden- base products – were selected for the product testing in 2014 in Latvia. In total 27 products were taken from the retail stores and purchased on-line. The focus was on the products which could be used in the nurseries, starting from finishing materials and ending with rocking horses. The products were tested with standard method EN ISO 717-3 (determination of formaldehyde release by flask method).

Only 7 out of 27 tested products would fulfill the Ecolabel criteria for formaldehyde emissions.

Highest concentrations of formaldehyde found in several children's rocking chairs and ready MDF (medium density fireboard) shelves.

RESULTS OF PRODUCT TESTING FOR FORMALDEHYDE IN 2014 IN LATVIA

Products		Concentration of formaldehyde			
		717-3 mg/kg	Perforator mg/100g	717-1 mg/m3	ISO 14184-1 mg/kg
Carpets	Pink carpet with kittens				6.2
	Red carpet with cars				6
	Grey carpet with city				9.1
Furniture	MDF shelf, white	4.1	5.9	0.1	
	MDF shelf, cream	5.3	7.6	0.1	
	MDF shelf, light brown	5.7	8.2	0.1	
	MDF shelf, red-brown	3.7	5.3	0.1	
	MDF shelf, dark brown	5.5	7.9	0.1	
Finishing materials	Chipboard	0.5	0.7	0.0	
	Plywood board, laminated	3.0	4.3	0.1	
	MDF board	6.3	9.1	0.2	
	Suspended ceilings, white	0.0	0.0	0.0	
Laminates	Laminate, light	2.7	3.9	0.1	
	Laminate, 3-colour	2.3	3.3	0.1	
	Laminates, speckled	3.3	4.8	0.1	
	Laminate, light grey	2.1	3.0	0.1	
	Laminate, board type	2.2	3.2	0.1	
Toys	Rocking horse, ornaments	6.3	9.1	0.2	
	Rocking horse, modern	6.4	9.2	0.2	
	Rocking horse, pink	0.0	0.0	0.0	
	Rocking horse, wooden	0.0	0.0	0.0	
Kids furniture	Kids chair, orange seat	12.7	18.3	0.3	
	Kids chair, wooden	0.0	0.0	0.0	
	Kids chair, white	4.1	5.9	0.1	
	Kids furniture, green	4.4	6.3	0.1	
	Kids furniture, yellow	3.9	5.6	0.1	
	Kids chair, wooden 2	0.0	0.0	0.0	

RESULTS
VOLATILE ORGANIC COMPOUNDS IN WOMEN SANITARY PADS

There are a lot of information about substances that should be avoided when choosing hygiene products, but as ingredients are not revealed on the labels and no information for society is available about testing of hygiene products from market surveillance institutions, it was decided to test several most popular women sanitary pads for formaldehyde and other volatile organic compounds. In 2015 in Lithuania 7 different kinds of women sanitary pads for formaldehyde and several other volatile organic compounds were tested. The products were tested for formaldehyde with standard method LST EN ISO 14184:2011, for volatile organic compounds (VOC) (styrene, acetone, acetonitrile, benzene, butyl acetate, ethanol, xilene, carbon tetrachloride, n-propanol, ethyl acetate, iso-propanol, tetra chloro ethylene, toluene, trichloro ethylene, methylene chloride, 2-butanone, tetrahydrofuran, n-butanol, cyclohexane, 2-ethoxy ethanol, n-pentanol, acetyl acetone, chlorobenzene, ethylbenzene, cyclohexanone, butyl acrylate, 2-butoxyethanol, butyl methacrylate, N,N-dimethylacrylamide) with HS/GC/MS gas chromatography.

There are only several NGO testing activities of such kind in USA and Canada, and the results are not encouraging, they found cancerogenic, toxic and irritating substances.

In all products, tested in Lithuania, only acetone and acetonitrile - these substances are irritating - have been detected.

Formaldehyde was not detected above detection limit in any of tested products.

RESULTS OF WOMEN SANITARY PADS TESTED FOR VOLATILE ORGANIC COMPOUNDS

Sanitary pads	Acetone, mg/kg	Acetonitrile, mg/kg	Iso-propanol, mg/kg	Ethanol, mg/kg
Ultra Thin Pads with Wings (Optima)	0,12	0,17	Not detected	0,23
Always Ultra (Standard)	0,12	0,18	Not detected	0,44
Always Sensitive (Ultra normal plus)	0,10	0,14	Not detected	0,31
Perfect Ultra Green (Bella)	0,06	0,19	Not detected	0,41
Ultra Camomile derma crem (Naturella)	0,10	0,13	Not detected	0,24
Pantiliners with Far-IR Anion Strip (Gentle Day)	0,09	0,27	0,15	0,63
Lady Anion (Incontinency pads)	0,05	0,20	Not detected	0,50

RESULTS
FORMAMIDE IN PRODUCTS FROM SOFT PLASTIC

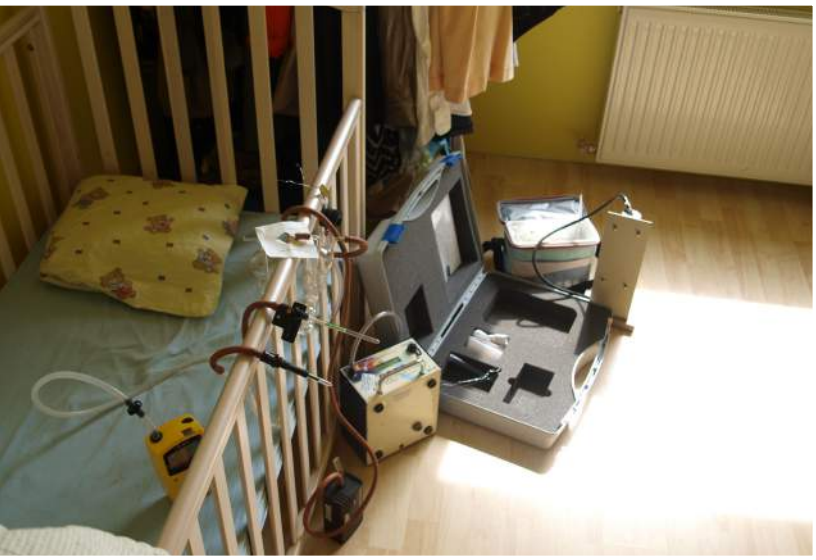
In Latvia in 2015 in cooperation with the Consumer Rights Protection Centre 25 soft plastic ethylenevinylacetate (EVA) articles (10 soft floor puzzles, 5 beach slippers, 10 fitness rugs) were tested for formamide - substance that is toxic for the reproductive system.

We didn't find any item with the formamide level above the European Union (EU) limits - currently 3000 mg of formamide per kg of product.

The bad news – children's floor puzzles were the most contaminated. For example, the permitted level in France is 20 times lower
(200 mg/kg) in order to protect still underdeveloped children's reproductive system. According to the French norms, four out of the tested floor puzzles should be taken out of the market.

Four puzzles, produced in China and Malaysia, had 232, 363, 430 and even 943 mg/kg formamide, which is up to four times more than it is allowed in France. Increased amount of formamide (270 mg / kg) was also in one of the fitness mats, but beach slippers turned out to be the cleanest items.

3.2 HAZARDOU
IN DUST AND IND



We wanted to show the influence of surrounding environment to our organisms. For that reason we tested volunteers' house dust for hazardous substances. Tested substances are semi-volatile i.e., they get in indoor air from various consumer goods and building materials, and some of them "settle" on the dust. Contaminated dust may be inhaled, swallowed with food; also they could enter the body when young children are putting dusty things into the mouth. The extent to which we can be exposed by hazardous substances from the dust depends on time spent indoors. It is stated that an adult spend up to 90% of his time indoor, and young children stay at home much longer, spending their time on the floor. As there was already conducted blood testing activity in Latvia in 2005 by WWF, this time indoor air quality of 15 nurseries was tested for substances wich can typically be found in indoor air and can have serious health negative effects (are toxic, allergenic, or linked with other unwanted health

US SUBSTANCES
OOR AIR

HOW TESTING WAS ORGANISED?

1

In spring-autumn of year 2013 professionals from Baltic Environmental Forum Lithuania took dust samples from the same volunteers, who gave blood, home according to methodology of research laboratory. It was agreed with volunteers about sampling date in advance, because house cannot be cleaned a week before sampling.

2

In Latvia indoor air tests were performed in nurseries of 15 households. The households were chosen from over 100 volunteers that applied to participate in the project, in a way to reach a maximum diversity both geographically and by interior of the nursery room. Households were chosen to be maximally different (old buildings/new buildings, recent renovation/no renovation, regular cleaning with household chemicals/use of water only, etc.) to show the potential differences on how households, their interiors and actions of inhabitants can influence the indoor air quality. Over 40 substances were tested in each household. Testing procedure in each case took around 3 hours in order to filtrate the necessary amount of air. Representatives from the contracted laboratory visited each household and took air samples which were later analysed.

3

Testing samples were sent to accredited laboratories – dust testing were sent to Eurofins laboratory in Sweden, indoor air analysis was performed in Latvian laboratory "Vides Audits".

RESULTS

HAZARDOUS SUBSTANCES IN DUST

Almost the same substances were detected in different dust samples, but concentrations differ. It depends on the things people have and use in their home environment. Part of dust we also bring in from outside.

It is important to note that perfluorinated compounds that were found in blood were detected only in two dust samples. These substances mainly enter the body by another way - with food, e.g. when heating food in non-stick cookware, eating food that has been stored in paper bags that are grease resistant.

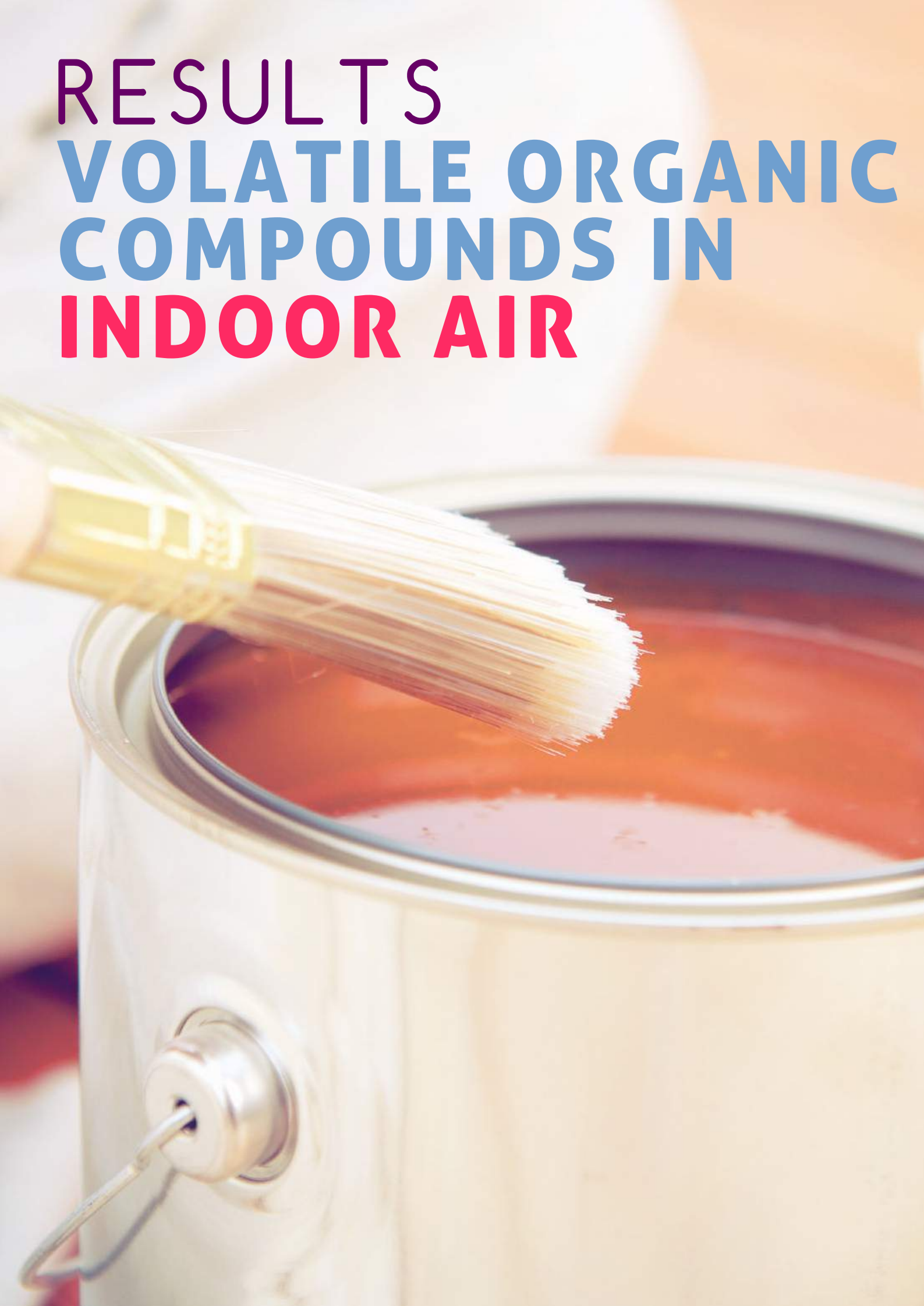
Most ussually in dust were found phthalates. Higher ammounts of phthalates have been found in dust samples but in blood concentrations were lower. Polybrominated diphenyl ethers were found in majority of dust samples they were also found in majority of blood samples.

One dust sample has showed high contamination with polybrominated diphenyl ethers, but in comparison with other studies the concentration is not outstanding.

The dust from those apartments which were cleaned more usually and thoroughly contained less hazardous substances and in lower concentrations.

RESULTS

VOLATILE ORGANIC COMPOUNDS IN INDOOR AIR



The indoor air quality analysis showed that carcinogenic and allergenic substances like formaldehyde in the indoor air exceeded ten times the allowed concentration. More careful selection of products and more diligent ventilation can significantly reduce the amount of hazardous substances at home as has been shown with second analysis.

The air in the tested nurseries also contained quite high concentrations of different organic solvents, especially toluene. The precautionary level (50 µg/m^3) for this substance group was exceeded 2 to 13 times in all tested nurseries.

Children's rooms were also polluted with fragrances. The test revealed that the allergenic fragrances, e.g. limonene, pinenes exceeded the recommended concentration (30 µg/m^3) 2 to 8 times in 11 out of 15 rooms.

RESULTS OF DUST TESTING

Substance	Abbreviation	Limit of detection	Concentration in dust						
			1	2	3	4	5	6	7
Phthalates		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Dimethyl phthalate	DMP	2.4	180	<	<	<	<	<	<
Diethyl phthalate	DEP	2.4	<	2.0	<	1.1	<	0,98	2,4
Diisobutyl phthalate	DBP	2.4	86	16	21	10	<	6,2	5,6
Butylbenzyl phthalate	BBP	2.4	120	8.7	100.0	2.0	<	1,8	11
Bis (2-n-ethylhexyl) phthalate	DEHP	2.4	230	350	640	290	160	310	54
Di-n-octyl phthalate	DOP	2.4	14	12	33	0.64	<	<	<
Diisononyl phthalate	DINP	2.4	120	110	300	28	320	200	35
Diisodecyl phthalate	DIDP	2.4	20	38	77	6.3	<	<	<
Polybrominated diphenyl ethers		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
2,2',4-Tribromo diphenylether	BDE-17	<0.15	<	<	<	<	<	<	0.934
2,2',4-Tribromo diphenylether	BDE-28	<0.15	0.20	0.193	0.63	0.17	<	<	3,27
2,2',4,4'-Tetrabromo diphenylether	BDE-47	0.3	6.65	4.17	3.55	3.17	1,9	1,21	158
2,2',4,5'-Tetrabromo diphenylether	BDE-49	0.3	<	<	<	<	<	<	3,53
2,3',4,4'-Tetrabromo diphenylether	PBDE 66	0.3	<	<	<	0.17	<	<	2,99
2,3',4',6Tetrabromo diphenylether	PBDE 71	0.3	<	<	<	<	<	<	0,429
3,3',4,4'-Tetrabromo diphenylether	PBDE 77	0.3	<	<	<	<	<	<	<
2,2',3,4,4'-Pentabromo diphenylether	BDE-85	0.6	<	<	<	<	<	<	4,47
2,2',4,4',5-Pentabromo diphenylether	BDE-99	0.6	8.87	5.22	6.68	5.10	2,69	1,49	130
2,2',4,4',6-Pentabromo diphenylether	BDE-100	0.6	1.79	1.18	1.17	0.97	<	<	27,4
2,3',4,4',6-Pentabromo diphenylether	PBDE-119	0.6	<	<	<	<	<	<	<
3,3',4,4',5-Pentabromo diphenylether	PBDE-126	0.6	<	<	<	<	<	<	<
2,2',3,4,4',5'-Hexabromo diphenylether	PBDE-138	0.9	<	<	<	<	<	<	<
2,2',4,4',5,5'-Hexabromo diphenylether	BDE-153	0.9	1.71	1.13	1.56	0.97	<	<	8,85
2,2',4,4',5,6'-Hexabromo diphenylether	BDE-154	0.9	<	<	<	<	<	<	5,86
2,3,3',4,4',5-Hexabromo diphenylether	PBDE-156	0.9	<	<	<	<	<	<	<
2,2',3,4,4',5',6-Heptabromo diphenylether	BDE-183	1.5	4.53	2.6	3.11	1.82	<	<	21,9
2,2',3,4,4',6,6'-Heptabromo diphenylether	PBDE-184	1.5	<	<	<	<	<	<	<
2,3,3',4,4',5,6-Heptabromo diphenylether	PBDE-191	1.5	<	<	<	<	<	<	<
2,2',3,3',4,4',5,6'-Octabromo diphenylether	PBDE-196	3.1	<	<	<	<	<	<	3,35
2,2',3,3',4,4',6,6'-Octabromo diphenylether	PBDE-197	3.1	<	<	<	<	<	<	6,89
2,2',3,3',4,4',5,5',6-Nonabromo diphenylether	PBDE-206	4.3	10.2	19	12.3	7.82	<	<	49,8
2,2',3,3',4,4',5,6,6'-Nonabromo diphenylether	PBDE-207	4.3	12	16.6	13.0	7.55	<	<	30,9
Decabromo diphenylether	BDE-209	4.3	321	811	428	173.00	171	167	4050
Perfluorinated compounds		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Perfluorooctane sulphonate	PFOS	2.2	<	<	<	<	<	<	<
Perfluorooctanoic acid	PFOA	2.2	<	<	<	2.2	<	<	2,6

RESULTS OF INDOOR AIR ANALYSIS

Substances		nursery 1 1257	nursery 2 1265	nursery 3 1337	nursery 4 1338	nursery 5 1339	nursery 6 1362	nursery 7 1375	nursery 8 1382	nursery 9 1391	nursery 10 1418	nursery 11 1445	nursery 12 1473	nursery 13 1474	nursery 14 1513	nursery 15 1514
		Concentration in air µg/m3*														
Formaldehyde	Formaldehyde	34	24	33	17	12	22	87	176	94	361	140	47	7	72	138
	2nd testing								31		46	41			43	46
Alcohols	Methanol	46.5	4.31	2.8	27.98	<0,5	227.1	5.8	10.7	<0,5	6.2	43.3	11.3	5.5	<0,5	7.1
	Ethanol	26.29	3.55	14.26	6.7	2.4	2.3	14	16.4	2.5	5.7	15	9	5.4	2.5	3.1
	Butanol	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	Isopropanol	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	Propanol	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	Isobutanol	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
Others	Tetrachlorethylene	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	1,2-dichloroethane	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	Ethyl cellosolve	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
Carbonyls	Butyl acetate	6.59	<0,5	12.14	7.76	<0,5	2.5	<0,5	2.8	2.3	6.1	5.5	<0,5	2.7	49.2	3.3
	Acetone	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5
	Ethyl acetate	11.38	252.78	<0,5	<0,5	<0,5	2.6	8.1	<0,5	<0,5	41.1	<0,5	3.3	<0,5	<0,5	<0,5
	Methyl ethyl ketone	8.45	9.1	6.21	7.91	4.9	5.6	8.7	8.9	4.5	7	7.6	5.5	4.7	5.2	4.8
Aromatic hydrocarbons	Toluene	116	240	670	193	386	344	141	129	152	99	472	95	232	155	164
	2nd testing								4		<0,5	6			21	7
	Ethyl benzene	5.44	2.68	3.07	4.82	<0,5	<0,5	3	<0,5	<0,5	6.6	3.8	3.2	3.3	6	3.6
	m-,p-xylene	14.94	6.58	6.39	13.62	1.5	2.1	7.6	1.9	<0,5	17.9	12.4	12.3	12.6	20.4	11.1
	Styrene	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	<0,5	8.4	<0,5
	o-xylene	5.06	1.83	2.58	4.15	<0,5	<0,5	2.6	<0,5	<0,5	5.2	3.8	3.9	3.4	6.6	3.2
Terpenes	α-pinene	95.88	36.44	130.59	37.11	42.1	43	114.4	71	237.9	7.5	56	8.8	210.8	196.7	29.9
	Limonene	15.02	7.37	23.51	14.47	7.9	15.8	8.7	14.6	14.7	10.8	13.3	5.8	17.5	21.6	11.3
	Linalool	4.6	3.97	7.48	0	4.5	2.8	<0,5	5.4	3.9	3.6	<0,5	<0,5	2.9	5.1	3
Phthalates	Dimethyl phthalate	0.015		0.042	0.308						0.234				1.75	
	Diethyl phthalate		0.016		0.036	0.05	0.056	0.048	0.268		0.039	0.053	0.037		0.18	0.083
	Diisobutyl phthalate			0.154	1.88	0.261	0.662		0.891	0.225	0.448	0.588	0.45	0.141	0.215	3.26
	Di-n-butyl phthalate						0.029						0.108			
	Di-n-hexyl phthalate	0.016														
	Butylbenzyl phthalate	0.06	0.055	0.016												
	Bis (2-n-ethylhexyl) phthalate											0.017	0.083	0.027		0.026
	Di-n-octyl phthalate		0.476							0.04						
	Di-n-nonyl phthalate	0.018														

3.3 HAZARDOU IN BLOOD

The blood of 20 volunteers in Lithuania and Estonia was tested for 28 chemicals which have hazardous longterm properties. There were detected from 5 to 12 hazardous substances in different levels in each sample of blood. These substances belong for three substance groups – phthalates, polybrominated diphenylethers and perfluoro compounds. These substances are persistent, accumulates in environment and organisms, are reported to cause cancer and suspected to alter endocrine system.

US SUBSTANCES

HOW TESTING WAS ORGANISED?

1

In spring of 2013 20 volunteers (10 from Lithuania and 10 from Estonia) were selected to test their blood for hazardous substances

2

In spring 2013 blood samples were taken in public with the presence of media. Medical professionals carried out the procedure. Blood test requires 50 ml blood sample. For comparison, blood donor normally gives 450 ml of blood, which is 9 times more

3

Testing samples were sent to accredited TNO laboratory in the Netherlands (Netherlands Organisation for applied scientific research TNO).

ARE BLOOD TESTS UNIQUE?

Blood testing for hazardous substances is not widespread because of the lack of approved medical diagnostic methods, which would link hazardous substances found in people's body and their concentrations to specific diseases. There is also a lack of medical professionals who would be able to interpret the results of such researches. Therefore, hazardous substances in human body are tested with the purpose of research and data collection.

The idea of campaign "Think before you buy" and blood testing comes from similar wide-spread and well-known international campaign "Detox" held by World Wildlife Fund (WWF) in year 2003-2006. Their campaign was held simultaneously in 13 countries. During it, blood of hundreds of volunteers was tested. There were 40 European Parliament members, 14 European ministers, medical professionals, scientists, famous people and three-generation representatives from 13 families among volunteers.

Test results have showed that "cocktail" of persistent, toxic and bio-accumulating hazardous substances contain in the blood of all volunteers.

Later on, those results were used as an argument to induce the emergence of tighter hazardous chemicals regulation in European Union. The campaign received huge attention and support from media, politicians and various international organizations. It also had significant contribution to the rise of public debate about negative impact of hazardous substances on health and the environment.

VOLUNTEERS

EVERY VOLUNTEER:

was decided to change his daily consumption habits for a healthy lifestyle and cleaner environment.

was interested in the environment protection and composition of everyday products.

was decided to spread the word about public health and environment-friendly lifestyle.

20 volunteers participated in blood tests. The dusts from the same 7 volunteers house from Lithuania were tested. Some of them were well-known celebrities like Lithuanian singers Jurgis Didžiulis and Erica Jennings-Didžiulis and Environment Vice-Minister Linas Jonauskas. Among the volunteers from Estonia were well-known journalist, well-known politician (Member of Parliament from Social Commission who deals with chemicals policy), specialists from Ministry of Environment, environmental scientist dealing with hazardous substances and marine protection. The others were eco-friendly active citizens.

Selected volunteers signed an agreement to give blood as well as to contribute to the research result dissemination. All volunteers were informed personally about their individual testing results and they decided themselves about making these results public.

RESULTS
BLOOD TEST

The sample analysis revealed that blood of all 20 volunteers' is contaminated with a cocktail of hazardous substances – 15 of 28 different substances were found.

Our test results demonstrate the urgency of the problem – hazardous substances are found in all blood samples – we all are being contaminated by irresponsible use of hazardous substances in production.

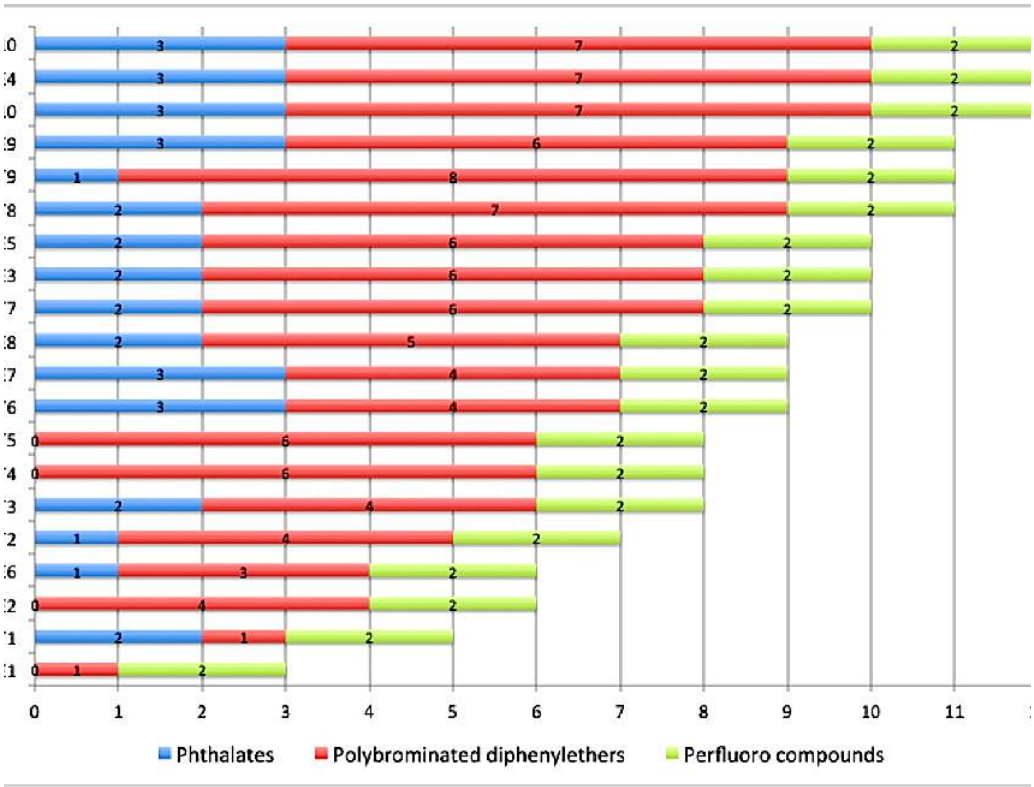
SUBSTANCES THAT WERE TESTED FOR AND FOUND SUBSTANCES

Substances	Abbreviation	Detected	Substances	Abbreviation	Detected	Substances	Abbreviation	Detected
Phthalates			Polybrominatde flame retardands			Perfluoro compounds		
Dimethyl phthalate	DMP	✔	Tetrabromobisphenol-A	TBBA	✔	Perfluorooctane sulphonate	PFOS	✔
Diethyl phthalate	DEP	✔	Hexabromo cyclododecane	HBCD	-	Perfluorooctanoic acid	PFOA	✔
Diisobutyl phthalate	DIBP	✔	2,2',4-Tribromo diphenylether	BDE-17	✔			
Dibutyl phthalate	DBP	-	2,2',4-Tribromo diphenylether	BDE-28	✔			
Butylbenzyl phthalate	BBP	✔	2,2',4,4'-Tetrabromo diphenylether	BDE-47	✔			
Dicyclohexyl phthalate	DCHP	-	2,2',4,5'-Tetrabromo diphenylether	BDE-49	✔			
Bis (2-n-ethylhexyl) phthalate	DEHP	✔	2,2',3,4,4'-Pentabromo diphenylether	BDE-85	-			
Difenyl phthalate	DPP	-	2,2',4,4',5-Pentabromo diphenylether	BDE-99	✔			
Di-n-octyl phthalate	DOP	-	2,2',4,4',6-Pentabromo diphenylether	BDE-100	✔			
Diisononyl phthalate	DINP	-	2,2',4,4',5,5'-hexabromo diphenylether	BDE-153	-			
Diisodecyl phthalate	DIDP	-	2,2',4,4',5,6'-Hexabromo diphenylether	BDE-154	-			
Di-n-nonyl phthalate	DNOP	-	2,2',3,4,4',5',6-Heptabromo diphenylether	BDE-183	-			
Bis (2-ethylhexyl) adipate	DEHA	-	Decabromo diphenylether	BDE-209	-			

**Phthalates were found in medical tubes where blood was taken.*

NUMBER OF SUBSTANCES FOUND IN EACH VOLUNTEERS BLOOD

In average- 9 (maximum – 12, minimum –5) hazardous substances were found in the blood of one volunteer.

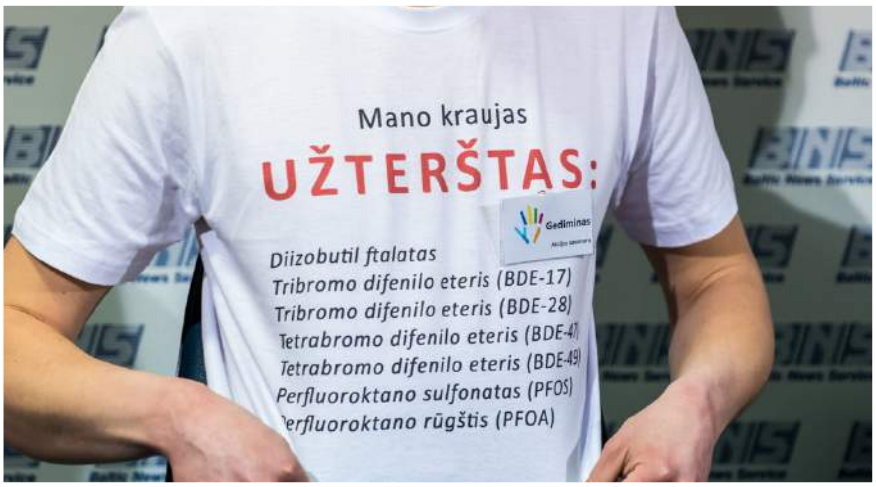


THE HIGHEST AND THE LOWEST CONCENTRATION OF SUBSTANCES DETECTED IN BLOOD

Substance group	Limit of detection*	Lowest detected concentration	Highest detected concentration	Comments
Phthalates	1-10 ng/g serum	1 ng/g serum	24 ng/g serum	This group of substances were found in 16 voluneer's serum samples.
Polybrominated diphenyl ethers	1-100 pg/g serum	1.1 pg/g serum	71 pg/g serum	They were found in all 20 volunteers serum samples. Dominating compounds are ones that prohibited to use. This once again shows how these substances are persistant and that they are still in our environment and the goods we bought in the past.
Perfluoro compounds	0.05 ng/g whole blood	0.25 ng/g whole blood	8.4 ng/g whole blood	Two perfluoro compound were analysed during investigation. Both of them were found in all samples.

** Detection limit is the lowest concentration of substance that could be detected in the laboratory. If the body contains lower concentration, the laboratory does not indicate it. In this table, the range is indicated in order to simplify data.*

The highest concentration of phthalates that was detected is 24ng/g serum, these substances were found in 80% of samples. The highest concentration of polybrominated diphenyletehrs - 71 pg/g serum, these substances were found in 100% of samples. The highest concentration of perfluorocompounds - 8.4 ng/g whole blood, these substances were found in 100% of samples.



CONCLUSIONS AND **RECOMMENDATIONS**

Our tests showed that hazardous substances are in products, home environment and in our bodies. This investigation was conducted with the purpose of public education, while the number of samples is too small to make more detailed and scientific analysis. Nevertheless some common conclusions and recommendations can be done.

Hazardous substances are in products, home environment and in our bodies. The Lithuanian product test for phthalates showed, that almost in 40% of products tested (26 out of 67) concentration of phthalates was higher than 0.1% its weight. Worrying facts is that in 6 out of 10 dolls, phthalate concentration exceeded the legal limit (0.1% its weight) from 191 to 322 times. Investigation also have shown, that there are still products with prohibited substances on the market: dibutyl phthalate (DBP) was detected in one nail polish and diethyl phthalate (DEP) was found in 2 perfumes. One of those perfumes was for children.

Formaldehyde presence test in wooden-base products conducted in Latvia showed that in all glued wooden products a glue containing formaldehyde was used, therefore such products could not meet the ecolabel criteria, but at the same time, their concentrations were not so high that this would cause some legal violations. A bit surprisingly, highest concentrations were observed in children's rocking horses and children's furniture from local producers.

Most usually in dust were found phthalates. One dust sample has showed big contamination with polybrominated diphenylethers. The dust from those apartments which were cleaned more usually and thoroughly contained less hazardous substances and in lower concentrations.

The indoor air quality analysis showed that carcinogenic and allergenic substances like formaldehyde in the indoor air exceeded ten times the allowed concentration. More careful selection of products and more diligent ventilation can significantly reduce the amount of hazardous substances at home as has been shown with second analysis. The air in the tested nurseries also contained quite high concentrations of different organic solvents, especially toluene. The precautionary level (50 $\mu g/m^3$) for this substance group was exceeded 2 to 13 times in all tested nurseries. Children's rooms were also polluted with fragrances. The test revealed that the allergenic fragrances, e.g. limonene, pinenes exceeded the recommended concentration (30 $\mu g/m^3$) 2 to 8 times in 11 out of 15 rooms.

Concentration of hazardous substances in volunteers' blood varies, its potential negative impact on health may depend on many factors - age, place of residence, workplace, metabolism, gender and etc. World scientists are continually discussing and there are no safe limits set for concentrations in blood. For this reason, it is currently impossible to say if concentrations found in Lithuanians and Estonians blood pose a serious threat to human health or not. On the other hand, there is increasing number of studies showing that also low concentrations may have adverse effects. Most importantly, hazardous substances should not get into our body at all. It is worrying that substances found are associated with cancers, fertility, human development disorders and other chronic diseases.

More research looking at the human health impacts of exposure to endocrine-disrupting chemicals is needed. However, presently there is more than adequate scientific evidence to indicate a need to reduce exposure to these hazardous substances. Baltic Environmental Forum advocates for the precautionary principle, which implies that in the absence of proof of no harm, a chemical should not be permitted for use in commerce. We have a duty to take steps to prevent further harm when it is within our power to do so.

Our campaign results add up to already conducted campaigns all over the world. We see that situation of hazardous substances use in the global market is changing very slowly. In EU despite that we have quite strict criteria for producing, importing and putting on market chemical substances as such or in articles; products in the shops still contain banned hazardous substances.

Today there is very long path until hazardous substances which are suspected to be toxic, carcinogenic, disrupting endocrine system become restricted. Furthermore, additive, cumulative, and synergistic effects of many common pollutants have not been adequately investigated by scientists. We think that ban of hazardous chemicals in consumer products must be regulated even stricter.

Industry should pay more attention to composition of produced, imported and sold products and substitution of hazardous substances in them.

Due to the fact that we are anyway exposed to hazardous substances and the high levels of uncertainties of the potential effects of this exposure, we recommend to take any possible opportunity and action to reduce exposure to chemicals. Even if the individual action may appear to be small, any contribution makes a difference. Consumers have no other choice but to learn about hazardous substances in products and ways how to avoid these substances. Also by increasing the demand of hazardous substance free products make changes in the supply chain.

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