Functionality testing of Hygio a40 Medi ozone cabinet

Requested by: Hygio Oy

VTT EXPERT SERVICES LTD

Requested by	Hygio Oy Turuntie 7, FI-24100 Salo Juhana Haukioja, Director +35841 544 5423
Order	Juhana Haukioja
Contact person	VTT Expert Services Ltd P.O. Box 1001 FI-02044 VTT, Finland Product Manager Kimmo Kaukanen Tel: +358-20-722 4859

Task **Functionality testing of Hygio a40 Medi ozone cabinet**

Assignment

Hygio Oy assigned VTT Expert Services Ltd (VTT) to perform a special test assignment to evaluate the functionality of Hygio a40 Medi ozone cabinet. The test was designed to define the effect of ozonisation (in Hygio a40 Medi ozone cabinet) regarding Polycyclic Aromatic Hydrocarbon (PAH) content in a special sample. The goal of the assignment was to define how efficient the ozone treatment is reducing PAH compounds. Polycyclic aromatic hydrocarbons (PAH) are components of incomplete combustion that can exist in both particle and gas phase. Of PAHs that are produced during fires, some are classified by expert organizations as carcinogenic to humans and some as probably or possibly carcinogenic to humans.

The test assignment started with the making of 16 pcs of specimen. The specimens were each 170 mm x 220 mm in size, and cut down pieces of a fire fighter outfit trousers. The specimens were exposed (contaminated) to smoke, heat and combustion products in a special made contamination chamber. Solid wood, oil and PE plastic sheets were burned to expose each specimen. After the exposure the specimen were divided in to groups. One group was sent directly to PAH testing. Another group was additionally exposed with 1 ml of oil, washed and ozonized with Hygio a40 Medi ozone cabinet and sent to PAH testing. One group was washed after contamination and sent to PAH testing. One group was ozonized and sent to PAH testing. One group was washed, ozonized and sent to PAH testing. This test report contains a description of the performed procedures, tests and the results.

Test method

Hygio Oy assigned VTT to design together with the client a special test method. The objective was to invent a procedure to define the effect of ozonisation (in Hygio a40 Medi ozone cabinet) on PAH content in a specific sample. The procedure is presented in this report. The actual analysis of PAH content was made in an external test laboratory at clients request.

Test specimen

The specimen were each 170 mm x 220 mm in size. All sample pieces were cut down of one fire fighter outfit trousers. In total 16 pieces were cut. The trousers were donated to the test assignment by the Fire brigade stationed in Leppävaara (Espoo, Finland). The trousers were used in regular fire fighter duties and taken

out of active service lately. The trousers were fabricated by Viking Life-Saving equipment A/S. The model was SB0933T-50. The sample piece material variated up on cut down location. Each sample had one to three main materials of possible three main materials. The main materials were luminous badges (stripes) [1] and two different fabrics [2] and [3]. One test sample is presented in picture 1 of this report. All sides of each sample were sewed, and the samples were marked to enable identification.

Picture 1. Test sample with all three varying main materials of the fire fighter outfit.

Test set-up and procedure

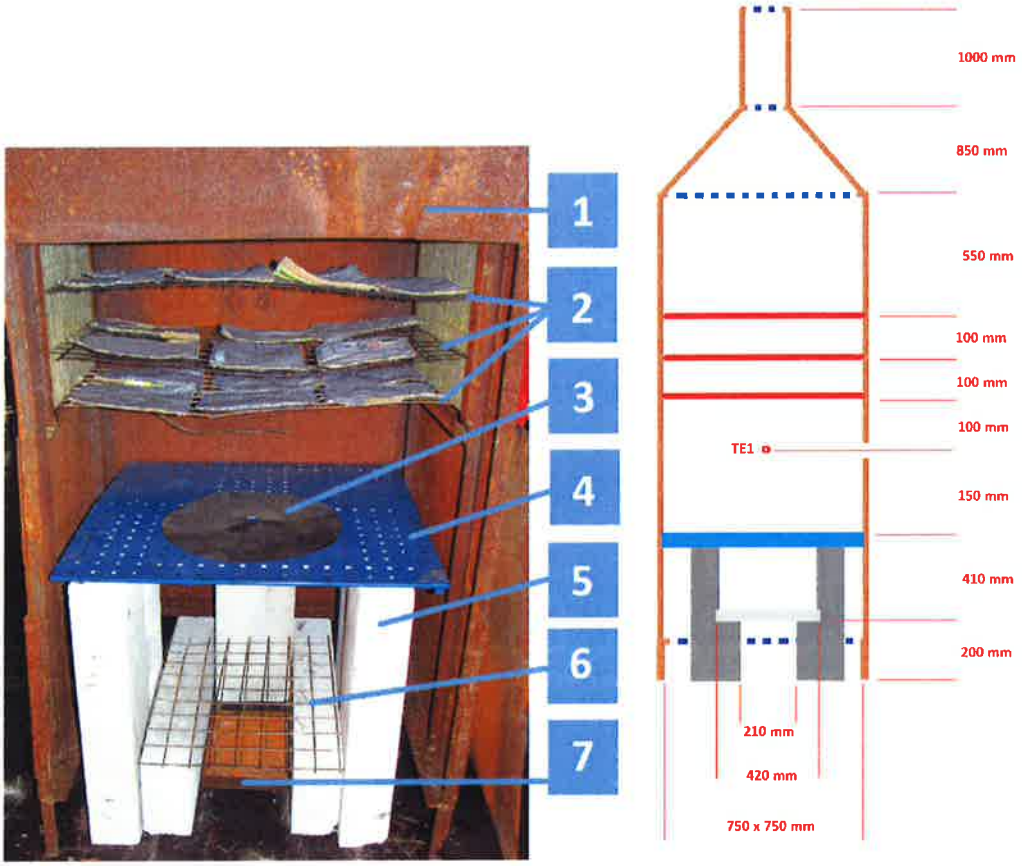
The treatment set-ups are presented in the following:

Test sample contamination by Smoke

The specimens were exposed (contaminated) by smoke, heat and combustion products in a special made contamination chamber.

The contamination chamber consisted of a grating, perforated plate, specimen chamber and of an exhaust pipe on top of the contamination chamber. The fuel (wood and oil) was placed on the grating. A perforated plate was placed approximately at a distance of 300 mm above the grating. The role of the perforated plate was to prevent actual flame contact with the samples. Above the plate was the contamination chamber for the specimens. The specimens were placed on a metal net on three horizontal layers. Solid wood and oil was burned to

expose the specimens to combustion gases and products of combustion. The set-up is presented in picture 2 of this report with the following parts: contamination chamber [1], 3 separate metal wire nets for samples [2], perforated plates [3, 4], supporting structures [5], grating for burned fuel [6] and ash box [7].



Picture 2. Test set-up of the sample contamination chamber

The procedure for contamination by smoke was the following: in the wood burning treatment, 200 g of spruce was the first batch. Additionally 100 g of wood was inserted approximately each 10 min. The exhaust gas temperature at point TE1 stayed under 90 °C. The heating was continued for 60 min.

In the oil / plastic heating phase, oil and PE plastic sheets were placed on the grating level and burned. The heating was continued for 60 min. The oil pan size was 20 cm x 20 cm. The weight of the plastic sheets were approximately 85g. One plastic sheet was added every 10 min.

Test sample contamination by 1ml of oil

The test sample group 5 was contaminated with 1 ml of oil. The oil brand was Neste PÖ5.

Washing and drying

The washing phase was performed at the Fire Brigade station washing room in Leppävaara (Espoo, Finland). The samples were washed in a standard washing machine (with the same detergent and procedure, as performed by fire brigade for the fire fighter clothing). After washing, the samples were dried at 60°C for one hour.

Ozone processing

The ozonisation was performed in a Hygio a40 Medi ozone cabinet separately for each sample group. The closet was set-up in the test laboratory premises and operated by the crew of the laboratory. The program used was Power 2h. The process, ozonisation content and functionality of the device were not verified in this assignment.

Date of tests 20th to 30th of June 2017.

Witnesses No witnesses were present during testing.

Instrumentation The weight of each sample was measured. The washing phase, ozonisation and contamination by oil were not instrumented (by measurement). The contamination oil amount was measured by a syringe. In the smoke contamination test, the weight of oil, plastic sheets and wood was measured before starting the phase. The smoke temperature was measured in the smoke contamination chamber at 100 mm distance below the first sample grid (picture 2, location TE1). The ozone content in the Hygio a40 Medi ozone cabinet was not verified during the ozonisation of samples in this assignment.

Test equipment The following Table 1 presents the test equipment used in the tests.

Table 1. Measurement equipment.

Test equipment	
Measurement	*Calibrated equipment*
Temperatures	K-type thermo element wire
Data acquisition system and software	Daq Lab / 2000 Series. DBK 84 module. DaisyLab software
Test time	Stop watch Extech 365515
Sample weight	Mettler PJ 3600 Delta Range

Performed tasks The following Table 2 presents the treatments made for the test specimens.

After the treatments were made for each sample (procedure according to table 2), the samples were sent to Eurofins Consumer product Testing in Hamburg,

Germany for analysing the amount of Polycyclic Aromatic Hydrocarbons (PAH) in the samples. The tests were performed according to AfPS GS 2014:01 PAK (Product Safety Commission, GS Specification, Testing and assessment of polycyclic aromatic hydrocarbons in the course of awarding the GS mark). The test facility is accredited according to DIN EN ISO/IEC 17025:2005 D-PL-14435-01-00. Each test result is presented separately in Annex 2. The customer chose the tested components. The samples were stored individually in sealed plastic bags in normal room temperature between the treatments and during delivery to the laboratory.

Table 2. The treatments made for test specimens.

Sample ID#	Contamination (smoke)	Contamination (Oil, 1ml)	Washed	Ozonized
Reference sample	-	-	-	-
1A	20.6.2017	-	-	-
1B	20.6.2017	-	-	-
1C	20.6.2017	-	-	-
2A	20.6.2017	-	-	30.6.2017
2B	20.6.2017	-	-	30.6.2017
2C	20.6.2017	-	-	30.6.2017
3A	20.6.2017	-	22.6.2017	-
3B	20.6.2017	-	22.6.2017	-
3C	20.6.2017	-	22.6.2017	-
4A	20.6.2017	-	22.6.2017	30.6.2017
4B	20.6.2017	-	22.6.2017	30.6.2017
4C	20.6.2017	-	22.6.2017	30.6.2017
5A	20.6.2017	21.6.2017	22.6.2017	30.6.2017
5B	20.6.2017	21.6.2017	22.6.2017	30.6.2017
5C	20.6.2017	21.6.2017	22.6.2017	30.6.2017

Test results

PAH analysis test comparison can be found in table 3.

Table 3. PAH analysis test results comparison

Test Number	Sample ID	Sum of 18 PAH [mg/kg]	Group mean value [mg/kg]	Group mean - ref. value Δm [mg/kg]
0 *	**	1.3	1.3	0
1.1	1a	8,7	11,0	9,7
1.2	1b	11,5		
1.3	1c	12,8		
2.1	2a	8,6	5,6	4,3
2.2	2b	2,8		
2.3	2c	5,5		
3.1	3a	11,3	10,6	9,3
3.2	3b	15,7		
3.3	3c	3,2		
4.1	4a	8,9	3,2	1,9
4.2	4b	0,2 (< 0,2)		
4.3	4c	0,5		
5.1	5a	3,2	5,8	4,5
5.2	5b	7,0		
5.3	5c	7,3		

* Reference test

** Reference sample

Evaluation

When using the test results, the following test scenario evaluation shall be taken in to account:

The fire department gave the fire fighter outfit for the testing. The actual service history of the outfit remains unknown. Only the reference sample gives a picture of the contamination base level before any test assignment actions. The reference test sample was not treated. In this assignment, the reference sample represents the amount of PAH accumulate during a normal duty cycle at the fire brigade station including storing and normal handling after washing. The contamination level in the sample taken from the fire fighter outfit fabric may vary trough out the samples, depending on the cut down location. In addition, all samples were different, having a different amount of the two main materials and luminous badges on the fabric. The sample amount was small and only one fire fighter outfit was tested.

Due to the parallel processing of the samples, the PAH analysis was performed for all samples only once in the end. This procedure format does not allow an absolute assessment of the PAH content, when comparing different samples, but it allows a basic comparison analysis of different phases of the sample mean value.

The contamination (by smoke and oil) process was invented in co-operation with the client. The purpose was to simulate a fire fighter duty cycle in relation to PAH exposure. This invented scenario cannot be held as the worst case scenario among fire fighter duties, however it is supposed to represent a 2 hour duty cycle when exposed to smoke and combustion gases originating from burning wood, oil and plastics.

Taking in to account the above presented assessments, the test result will apply only for the tested sample. The PAH content reference cannot be verified to present any defined sampling space. However since all samples were taken from the same fire fighter outfit, this study will give a picture how the PAH content variation changes due to washing and ozonisation in one sample.

To evaluate the results, a mean value of each group was calculated. The results shall be held as approximate due to the small sample amount taken from one outfit.

Test result evaluation

Taking in to account the information given in the chapter above, the results could be evaluated as follows:

After the contamination phase the PAH content mean value in the samples (Group 1) was approximately 9.7 mg/kg higher than the reference sample. The PAH content of the test specimen with the highest PAH content in the group 1, was approximately 11.5 mg/kg higher than the reference sample.

When the samples were first contaminated and then ozonized, the PAH content mean value in the samples (Group 2) was approximately 4.3 mg/kg higher than the reference sample. The PAH content of the test specimen with the highest PAH content in the group 2, was approximately 7.3 mg/kg higher than the reference sample.

When the samples were first contaminated and then washed, the PAH content mean value in the samples (Group 3) was approximately 9.3 mg/kg higher than the reference sample. The PAH content of the test specimen with the highest PAH content in the group 3, was approximately 14.4 mg/kg higher than the reference sample.

When the samples were first contaminated and then washed and ozonized, the PAH content mean value in the samples (Group 4) was approximately 1.9 mg/kg higher than the reference sample. The PAH content of the test specimen with the highest PAH content in the group 4, was approximately 7.6 mg/kg higher than the reference sample.

When the samples were first contaminated, additionally contaminated by 1 ml of oil and then washed and ozonized, the PAH content mean value in the samples (Group 5) was approximately 4.5 mg/kg higher than the reference sample. The

PAH content of the test specimen with the highest PAH content in the group 5, was approximately 6.0 mg/kg higher than the reference sample.

According to the results, the PAH content mean value was 47 % smaller in sample group 2 (which were only ozonized after contamination by smoke) compared to sample group 3 (only washed after smoke contamination).

According to the results, the PAH content mean value was 71 % smaller in sample group 4 (which were washed and ozonized after contamination by smoke) compared to sample group 3 (which were only washed after smoke contamination).

According to the results, the PAH content mean value was 47 % smaller in sample group 5 (which were contaminated with smoke and additionally with 1ml of oil, washed and ozonized) compared to sample group 3 (which were only washed after smoke contamination).

Summary

This report presents in detail the test set-up, the tests, test conditions, test results and evaluation when the test samples were first contaminated, treated and finally tested to define PAH content.

Ozonizing the tested sample in Hygio a40 Medi device, reduced the PAH compound mean value in comparison to a washed sample by 47 %. The best reduction of PAH compounds in a sample was achieved when the contaminated sample was first washed and then ozonized. Performing both washing and ozonizing reduced the total amount of PAH compounds in the sample by 71 % in comparison with the sample only washed. The test results are valid only for the tested samples. The chapter *evaluation* shall be taken in to account when assessing the usability of the results.

Espoo, 2nd October 2017

Kai Renholm
Business Manager

Kimmo Kaukanen
Product Manager

APPENDICES:

Annex 1	Hygio a40 Medi ozone cabinet
Annex 2	Test results
Annex 3	Photographs

DISTRIBUTION

Client,	1 Original
VTT/Archives	1 Original

HYGIO®

Hygio a40 Medi

High quality hygiene is a prerequisite for good health care.

Disinfection of gear and equipment used in health care is challenging as many of the items don't tolerate high temperatures, disinfecting chemicals or wash.

Hygio ozone processing chamber makes disinfection easy, fast and effective. Cleaning can now be done more often and this contributes as high quality hygiene.

Textiles and equipment can be disinfected with Hygio as they are, without disassemble of parts. After cleaning, the items are ready for use immediately.

The higher power of a40 Medi programs disinfects also challenging sporicidial bacteria, yeasts and molds.

Hygio is suitable for disinfecting all clothes and foot wear, accessories, x-ray protective shields, patient handling equipment, books and toys, for example.

Even electronic devices, such as mobile phones, computers and electronic medical instruments can be disinfected with the Sensitive programs.

Hygio removes odours and disease transmitters.

Quality of hygiene improves
Risk of contagion lowers
Customer satisfaction improves
Job satisfaction improves
Work place safety improves
Makes cleaning processes faster
Reduces textile and equipment wear, product life increases
Lowers laundry costs
Number of clothes /pairs in the cleaning cycle can be reduced
Use of cleaning and disinfection chemicals can be reduced
Energy consumption reduces
Water consumption reduces

Type	Tested microbe	Microbial reduction / log cfu/ pcs (1h program)	Correlates with
Sporicidial bacteria	Bacillus spores	1,4	Clostridium difficile, Bacillus cereus, Clostridium botulinum
Gram-positive	Staphylococcus epidermidis	>5,2	MRSA, MRSP, Listeria, Streptococcus
Gram-negative	Escherichia coli	3,9	Salmonella, ESBL, EHEC, Norovirus, All other viruses
Yeasts	Candida albicans	1,6	Cryptococcus
Molds	Cladosporium sphaerospermum	1,8	Aspergillus, Fusarium

1 = 1/10 2 = 1/100 3 = 1/1 000 4 = 1/ 10 000 5 = 1/ 100 000

Program:	**O_3-dose:**
1 h sensitive	1 X
6 h sensitive	6 X
2 h power	6 X

Measures:

Height:	1900 mm
Width:	550 mm
Depth:	650 mm
Weight	ca.105 kg

Interior:

Height:	1470 mm
Width:	430 mm
Depth :	595 mm

Electrical supply:

Voltage:	230 V
Power:	80 W

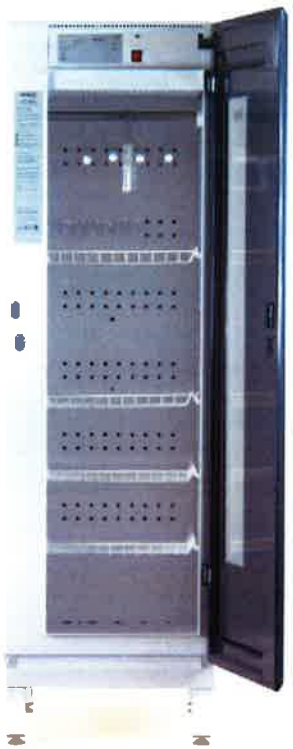
Miscellaneous:

Use at 20-35 °C in a dry room.

No connection to ventilation is needed.

An air-tight, closed process neutralizes ozone back to normal oxygen at the end of each program: No smell of ozone at the place of use.

Ozone disinfection is not suitable for natural rubber (latex).



APPENDIX NO. 2 (33 pages)
REPORT NO: VTT-S-5178-17
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VTT EXPERT SERVICES LTD

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Sample code Nr.	**493-2017-00034493**	**Date**	**11.7.2017**	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014677-01**			

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Client Code:: FL0001927

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Technical contact for your orders :

Sample described as:	Nolla, referenssi nolla		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

Results

JR0EC	JR	Polycyclic Aromatic Hydrocarbons (PAHs) in products	Method: AfPS GS 2014:01 PAK	
(a)	Acenaphthene		<0.1	mg/kg
(a)	Acenaphthylene		0.11	mg/kg
(a)	Anthracene		<0.1	mg/kg
(a)	Benzo(a)anthracene		<0.1	mg/kg
(a)	Benzo(a)pyrene		<0.1	mg/kg
(a)	Benzo(b)fluoranthene		<0.1	mg/kg
(a)	Benzo(e)pyrene		<0.1	mg/kg
(a)	Benzo(ghi)perylene		<0.1	mg/kg
(a)	Benzo-(j)-fluoranthen		<0.1	mg/kg
(a)	Benzo-(k)-fluoranthene		<0.1	mg/kg
(a)	Chrysene		<0.1	mg/kg
(a)	Dibenzo(a,h)anthracene		<0.1	mg/kg
(a)	Fluoranthene		0.40	mg/kg
(a)	Fluorene		<0.1	mg/kg
(a)	Indeno(1,2,3-cd)pyrene		<0.1	mg/kg
(a)	Naphthalene		<0.1	mg/kg
(a)	Phenanthrene		0.57	mg/kg
(a)	Pyrene		0.37	mg/kg
(a)	Sum 18 PAH		1.3	mg/kg

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Sample code Nr.	493-2017-00034493	Date	11.7.2017	Page 2 / 2
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CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

SIGNATURE

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EXPLANATORY NOTE

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

JR - Eurofins Consumer Product Testing (Hamburg), GERMANY - DIN EN ISO/IEC 17025:2005 D-PL-14435-01-00

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Technical contact for your orders :

Sample described as:	1A, kontaminoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

Results

JR0EC	JR	Polycyclic Aromatic Hydrocarbons (PAHs) in products	Method: AfPS GS 2014:01 PAK
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.87	mg/kg
(a)	Anthracene	0.62	mg/kg
(a)	Benzo(a)anthracene	0.26	mg/kg
(a)	Benzo(a)pyrene	0.12	mg/kg
(a)	Benzo(b)fluoranthene	0.15	mg/kg
(a)	Benzo(e)pyrene	0.20	mg/kg
(a)	Benzo(ghi)perylene	0.11	mg/kg
(a)	Benzo-(j)-fluoranthen	0.11	mg/kg
(a)	Benzo-(k)-fluoranthene	<0.1	mg/kg
(a)	Chrysene	0.25	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	1.4	mg/kg
(a)	Fluorene	0.36	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0.1	mg/kg
(a)	Naphthalene	0.14	mg/kg
(a)	Phenanthrene	2.8	mg/kg
(a)	Pyrene	1.9	mg/kg
(a)	Sum 18 PAH	8.7	mg/kg

Sample code Nr. 493-2017-00034494 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014679-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
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Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

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(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	1.1	mg/kg
(a)	Anthracene	1.0	mg/kg
(a)	Benzo(a)anthracene	0.24	mg/kg
(a)	Benzo(a)pyrene	<0.1	mg/kg
(a)	Benzo(b)fluoranthene	0.11	mg/kg
(a)	Benzo(e)pyrene	<0.1	mg/kg
(a)	Benzo(ghi)perylene	<0.1	mg/kg
(a)	Benzo-(j)-fluoranthen	<0.1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0.1	mg/kg
(a)	Chrysene	0.27	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	1.7	mg/kg
(a)	Fluorene	0.48	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0.1	mg/kg
(a)	Naphthalene	0.21	mg/kg
(a)	Phenanthrene	4.2	mg/kg
(a)	Pyrene	2.3	mg/kg
(a)	Sum 18 PAH	11.5	mg/kg

Sample code Nr. 493-2017-00034495 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014680-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2:FAIL / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum Sum	< 20 / < 50 Sum Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034496**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014681-01**		

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Technical contact for your orders :

Sample described as:	1C, kontaminoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

Results

JR0EC	JR	Polycyclic Aromatic Hydrocarbons (PAHs) in products	Method: AfPS GS 2014:01 PAK
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.46	mg/kg
(a)	Anthracene	0.40	mg/kg
(a)	Benzo(a)anthracene	0.79	mg/kg
(a)	Benzo(a)pyrene	0.49	mg/kg
(a)	Benzo(b)fluoranthene	0.55	mg/kg
(a)	Benzo(e)pyrene	0.96	mg/kg
(a)	Benzo(ghi)perylene	0.58	mg/kg
(a)	Benzo-(j)-fluoranthen	0.47	mg/kg
(a)	Benzo-(k)-fluoranthene	0.33	mg/kg
(a)	Chrysene	0.77	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	1.8	mg/kg
(a)	Fluorene	0.20	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	0.46	mg/kg
(a)	Naphthalene	0.10	mg/kg
(a)	Phenanthrene	1.6	mg/kg
(a)	Pyrene	2.9	mg/kg
(a)	Sum 18 PAH	12.8	mg/kg

Sample code Nr. 493-2017-00034496 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014681-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: FAIL / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum Sum	< 20 / < 50 Sum Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034497**	**Date**	**11.7.2017** **Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014682-01**		

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Technical contact for your orders :

Sample described as:	2A, Kontaminoitu + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.33	mg/kg
(a)	Anthracene	0.46	mg/kg
(a)	Benzo(a)anthracene	0.31	mg/kg
(a)	Benzo(a)pyrene	0.17	mg/kg
(a)	Benzo(b)fluoranthene	0.24	mg/kg
(a)	Benzo(e)pyrene	0.23	mg/kg
(a)	Benzo(ghi)perylene	0.14	mg/kg
(a)	Benzo-(j)-fluoranthen	0.13	mg/kg
(a)	Benzo-(k)-fluoranthene	0.11	mg/kg
(a)	Chrysene	0.39	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	1.9	mg/kg
(a)	Fluorene	0.24	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	0.12	mg/kg
(a)	Naphthalene	0.10	mg/kg
(a)	Phenanthrene	2.4	mg/kg
(a)	Pyrene	2.1	mg/kg
(a)	Sum 18 PAH	8.6	mg/kg

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Sample code Nr. 493-2017-00034497 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014682-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034498**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014683-01**		

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Technical contact for your orders :

Sample described as:	2B, Kontaminoitu + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0,1	mg/kg
(a)	Acenaphthylene	0,12	mg/kg
(a)	Anthracene	<0,1	mg/kg
(a)	Benzo(a)anthracene	0,10	mg/kg
(a)	Benzo(a)pyrene	0,15	mg/kg
(a)	Benzo(b)fluoranthene	0,26	mg/kg
(a)	Benzo(e)pyrene	<0,1	mg/kg
(a)	Benzo(ghi)perylene	0,10	mg/kg
(a)	Benzo-(j)-fluoranthen	<0,1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0,1	mg/kg
(a)	Chrysene	0,25	mg/kg
(a)	Dibenzo(a,h)anthracene	<0,1	mg/kg
(a)	Fluoranthene	1,0	mg/kg
(a)	Fluorene	0,12	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0,1	mg/kg
(a)	Naphthalene	<0,1	mg/kg
(a)	Phenanthrene	0,59	mg/kg
(a)	Pyrene	0,66	mg/kg
(a)	Sum 18 PAH	2,8	mg/kg

Sample code Nr. 493-2017-00034498 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014683-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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Sample code Nr.	**493-2017-00034499**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014684-01**		

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Technical contact for your orders :

Sample described as:	2C, Kontaminoitu + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

Results

JR0EC	JR	Polycyclic Aromatic Hydrocarbons (PAHs) in products	Method: AfPS GS 2014:01 PAK	
(a)	Acenaphthene		<0.1	mg/kg
(a)	Acenaphthylene		0.21	mg/kg
(a)	Anthracene		0.18	mg/kg
(a)	Benzo(a)anthracene		0.33	mg/kg
(a)	Benzo(a)pyrene		0.25	mg/kg
(a)	Benzo(b)fluoranthene		0.34	mg/kg
(a)	Benzo(e)pyrene		0.29	mg/kg
(a)	Benzo(ghi)perylene		0.20	mg/kg
(a)	Benzo-(j)-fluoranthen		0.22	mg/kg
(a)	Benzo-(k)-fluoranthene		0.16	mg/kg
(a)	Chrysene		0.38	mg/kg
(a)	Dibenzo(a,h)anthracene		<0.1	mg/kg
(a)	Fluoranthene		1.0	mg/kg
(a)	Fluorene		0.19	mg/kg
(a)	Indeno(1,2,3-cd)pyrene		0.15	mg/kg
(a)	Naphthalene		0.11	mg/kg
(a)	Phenanthrene		1.0	mg/kg
(a)	Pyrene		1.3	mg/kg
(a)	Sum 18 PAH		5.5	mg/kg

Sample code Nr. 493-2017-00034499 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014684-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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Sample code Nr.	493-2017-00034500	Date	11.7.2017	Page 1 / 2
Analytical Report Nr.	AR-17-FL-014685-01			

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Technical contact for your orders :

Sample described as:	3A, kontaminoitu + pesty		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.26	mg/kg
(a)	Anthracene	0.33	mg/kg
(a)	Benzo(a)anthracene	0.75	mg/kg
(a)	Benzo(a)pyrene	0.54	mg/kg
(a)	Benzo(b)fluoranthene	0.57	mg/kg
(a)	Benzo(e)pyrene	1.1	mg/kg
(a)	Benzo(ghi)perylene	0.56	mg/kg
(a)	Benzo-(j)-fluoranthen	0.49	mg/kg
(a)	Benzo-(k)-fluoranthene	0.35	mg/kg
(a)	Chrysene	0.77	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	1.4	mg/kg
(a)	Fluorene	0.14	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	0.50	mg/kg
(a)	Naphthalene	0.11	mg/kg
(a)	Phenanthrene	1.3	mg/kg
(a)	Pyrene	2.4	mg/kg
(a)	Sum 18 PAH	11.3	mg/kg

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Sample code Nr. 493-2017-00034500 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014685-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / FAIL

The carcinogenic PAH Benzo(e)pyrene exceeds the limit.

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: FAIL / cat.3: FAIL

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum Sum	< 20 / < 50 Sum Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings does not comply with the above stated requirements and recommendations.

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EXPLANATORY NOTE

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034501**	**Date**	**11.7.2017** **Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014686-01**		

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Technical contact for your orders :

Sample described as:	3B, kontaminoitu + pesty		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0,1	mg/kg
(a)	Acenaphthylene	0,75	mg/kg
(a)	Anthracene	1,2	mg/kg
(a)	Benzo(a)anthracene	0,50	mg/kg
(a)	Benzo(a)pyrene	0,18	mg/kg
(a)	Benzo(b)fluoranthene	0,21	mg/kg
(a)	Benzo(e)pyrene	0,31	mg/kg
(a)	Benzo(ghi)perylene	0,11	mg/kg
(a)	Benzo-(j)-fluoranthen	0,16	mg/kg
(a)	Benzo-(k)-fluoranthene	0,11	mg/kg
(a)	Chrysene	0,51	mg/kg
(a)	Dibenzo(a,h)anthracene	<0,1	mg/kg
(a)	Fluoranthene	3,0	mg/kg
(a)	Fluorene	0,40	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0,1	mg/kg
(a)	Naphthalene	0,12	mg/kg
(a)	Phenanthrene	4,6	mg/kg
(a)	Pyrene	4,2	mg/kg
(a)	Sum 18 PAH	15,7	mg/kg

Sample code Nr. 493-2017-00034501 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014686-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: FAIL / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034502**	**Date**	**11.7.2017** **Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014687-01**		

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Technical contact for your orders :

Sample described as:	3C, kontaminoitu + pesty		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

Results

JR0EC	JR	Polycyclic Aromatic Hydrocarbons (PAHs) in products	Method: AfPS GS 2014:01 PAK
(a)	Acenaphthene		<0.1 mg/kg
(a)	Acenaphthylene		0.27 mg/kg
(a)	Anthracene		0.22 mg/kg
(a)	Benzo(a)anthracene		0.19 mg/kg
(a)	Benzo(a)pyrene		0.19 mg/kg
(a)	Benzo(b)fluoranthene		0.18 mg/kg
(a)	Benzo(e)pyrene		0.35 mg/kg
(a)	Benzo(ghi)perylene		0.21 mg/kg
(a)	Benzo-(j)-fluoranthen		0.16 mg/kg
(a)	Benzo-(k)-fluoranthene		0.11 mg/kg
(a)	Chrysene		0.19 mg/kg
(a)	Dibenzo(a,h)anthracene		<0.1 mg/kg
(a)	Fluoranthene		0.33 mg/kg
(a)	Fluorene		0.18 mg/kg
(a)	Indeno(1,2,3-cd)pyrene		0.20 mg/kg
(a)	Naphthalene		<0.1 mg/kg
(a)	Phenanthrene		1.1 mg/kg
(a)	Pyrene		0.50 mg/kg
(a)	Sum 18 PAH		3.2 mg/kg

Sample code Nr. 493-2017-00034502 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014687-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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Sample code Nr.	**493-2017-00034503**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014688-01**		

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Technical contact for your orders :

Sample described as:	4A, kontaminoitu + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.27	mg/kg
(a)	Anthracene	0.51	mg/kg
(a)	Benzo(a)anthracene	0.42	mg/kg
(a)	Benzo(a)pyrene	0.24	mg/kg
(a)	Benzo(b)fluoranthene	0.31	mg/kg
(a)	Benzo(e)pyrene	0.33	mg/kg
(a)	Benzo(ghi)perylene	0.18	mg/kg
(a)	Benzo-(j)-fluoranthen	0.22	mg/kg
(a)	Benzo-(k)-fluoranthene	0.16	mg/kg
(a)	Chrysene	0.52	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	2.5	mg/kg
(a)	Fluorene	0.20	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	0.17	mg/kg
(a)	Naphthalene	<0.1	mg/kg
(a)	Phenanthrene	0.50	mg/kg
(a)	Pyrene	2.9	mg/kg
(a)	Sum 18 PAH	8.9	mg/kg

Sample code Nr. 493-2017-00034503 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014688-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: FAIL / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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Sample code Nr.	**493-2017-00034504**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014689-01**		

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Technical contact for your orders :

Sample described as:	4B, kontaminoitu + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	<0.1	mg/kg
(a)	Anthracene	<0.1	mg/kg
(a)	Benzo(a)anthracene	<0.1	mg/kg
(a)	Benzo(a)pyrene	<0.1	mg/kg
(a)	Benzo(b)fluoranthene	<0.1	mg/kg
(a)	Benzo(e)pyrene	<0.1	mg/kg
(a)	Benzo(ghi)perylene	<0.1	mg/kg
(a)	Benzo-(j)-fluoranthen	<0.1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0.1	mg/kg
(a)	Chrysene	<0.1	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	0.13	mg/kg
(a)	Fluorene	<0.1	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0.1	mg/kg
(a)	Naphthalene	<0.1	mg/kg
(a)	Phenanthrene	0.16	mg/kg
(a)	Pyrene	0.10	mg/kg
(a)	Sum 18 PAH	<0.2	mg/kg

Sample code Nr. 493-2017-00034504 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014689-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: PASS / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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Sample code Nr.	**493-2017-00034505**	**Date**	**11.7.2017** **Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014690-01**		

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Technical contact for your orders :

Sample described as:	4C, kontaminoitu + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	<0.1	mg/kg
(a)	Anthracene	<0.1	mg/kg
(a)	Benzo(a)anthracene	<0.1	mg/kg
(a)	Benzo(a)pyrene	<0.1	mg/kg
(a)	Benzo(b)fluoranthene	0.14	mg/kg
(a)	Benzo(e)pyrene	<0.1	mg/kg
(a)	Benzo(ghi)perylene	<0.1	mg/kg
(a)	Benzo-(j)-fluoranthen	<0.1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0.1	mg/kg
(a)	Chrysene	<0.1	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	0.23	mg/kg
(a)	Fluorene	<0.1	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0.1	mg/kg
(a)	Naphthalene	<0.1	mg/kg
(a)	Phenanthrene	0.29	mg/kg
(a)	Pyrene	0.13	mg/kg
(a)	Sum 18 PAH	0.5	mg/kg

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CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: PASS / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact		Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)	
		Toys	other Products	Toys	other Products
Benzo[a]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[e]phyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[a]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[b]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[j]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[k]fluoranthen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Chrysen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Dibenzo[a,h]anthracen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Benzo[ghi]perylen	< 0,2	<0,2	< 0,5	< 0,5	< 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2	< 0,5	< 0,5	< 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Napthalin	< 1	< 2		< 10	
Sum 18 PAH	< 1	< 5	< 10	< 20	< 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034506**	**Date**	**11.7.2017** **Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014691-01**		

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Technical contact for your orders :

Sample described as:	5A, kontaminoitu + öljy + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	<0.1	mg/kg
(a)	Anthracene	<0.1	mg/kg
(a)	Benzo(a)anthracene	<0.1	mg/kg
(a)	Benzo(a)pyrene	<0.1	mg/kg
(a)	Benzo(b)fluoranthene	0.12	mg/kg
(a)	Benzo(e)pyrene	<0.1	mg/kg
(a)	Benzo(ghi)perylene	<0.1	mg/kg
(a)	Benzo-(j)-fluoranthen	<0.1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0.1	mg/kg
(a)	Chrysene	<0.1	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	0.33	mg/kg
(a)	Fluorene	0.46	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0.1	mg/kg
(a)	Naphthalene	<0.1	mg/kg
(a)	Phenanthrene	1.2	mg/kg
(a)	Pyrene	1.2	mg/kg
(a)	Sum 18 PAH	3.2	mg/kg

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CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
(MU) = Expanded measurement uncertainty (k=2)

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Sample code Nr.	**493-2017-00034507**	**Date** 11.7.2017	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014692-01**		

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Technical contact for your orders :

Sample described as:	5B, kontaminoitu + öljy + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0.1	mg/kg
(a)	Acenaphthylene	0.26	mg/kg
(a)	Anthracene	<0.1	mg/kg
(a)	Benzo(a)anthracene	0.22	mg/kg
(a)	Benzo(a)pyrene	0.22	mg/kg
(a)	Benzo(b)fluoranthene	0.27	mg/kg
(a)	Benzo(e)pyrene	0.28	mg/kg
(a)	Benzo(ghi)perylene	0.19	mg/kg
(a)	Benzo-(j)-fluoranthen	0.18	mg/kg
(a)	Benzo-(k)-fluoranthene	0.13	mg/kg
(a)	Chrysene	0.31	mg/kg
(a)	Dibenzo(a,h)anthracene	<0.1	mg/kg
(a)	Fluoranthene	<0.1	mg/kg
(a)	Fluorene	0.94	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	0.15	mg/kg
(a)	Naphthalene	0.18	mg/kg
(a)	Phenanthrene	2.0	mg/kg
(a)	Pyrene	2.5	mg/kg
(a)	Sum 18 PAH	7.0	mg/kg

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Analytical Report Nr. AR-17-FL-014692-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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Sample code Nr.	**493-2017-00034508**	**Date**	**11.7.2017**	**Page 1 / 2**
Analytical Report Nr.	**AR-17-FL-014693-01**			

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Technical contact for your orders :

Sample described as:	5C, kontaminoitu + öljy + pesty + otsonoitu		
Sample reception date:	04.07.2017	**Analysis starting date:**	04.07.2017

		Results	
JR0EC	**JR** **Polycyclic Aromatic Hydrocarbons (PAHs) in products**	**Method: AfPS GS 2014:01 PAK**	
(a)	Acenaphthene	<0,1	mg/kg
(a)	Acenaphthylene	0,13	mg/kg
(a)	Anthracene	0,31	mg/kg
(a)	Benzo(a)anthracene	0,18	mg/kg
(a)	Benzo(a)pyrene	<0,1	mg/kg
(a)	Benzo(b)fluoranthene	0,17	mg/kg
(a)	Benzo(e)pyrene	<0,1	mg/kg
(a)	Benzo(ghi)perylene	<0,1	mg/kg
(a)	Benzo-(j)-fluoranthen	<0,1	mg/kg
(a)	Benzo-(k)-fluoranthene	<0,1	mg/kg
(a)	Chrysene	0,24	mg/kg
(a)	Dibenzo(a,h)anthracene	<0,1	mg/kg
(a)	Fluoranthene	1,8	mg/kg
(a)	Fluorene	0,39	mg/kg
(a)	Indeno(1,2,3-cd)pyrene	<0,1	mg/kg
(a)	Naphthalene	0.13	mg/kg
(a)	Phenanthrene	2,5	mg/kg
(a)	Pyrene	2,0	mg/kg
(a)	Sum 18 PAH	7,3	mg/kg

Sample code Nr. 493-2017-00034508 **Date** 11.7.2017 **Page 2 / 2**

Analytical Report Nr. AR-17-FL-014693-01

CONCLUSION

REACH Regulation 1907/2006
8 Carcinogenic PAHs: limit 1 mg/kg / PASS

AfPS-GS-2014-01
18 PAHs: cat.1: FAIL / cat.2: PASS / cat.3: PASS

Parameter	Category 1 Components that are to be taken into the mouth or toy components with intended and long-term skin contact (> 30 s)	Category 2 Components not covered by cat. 1 with foreseeable skin contact longer than 30 s (long term skin contact) or repeated short term skin contact	Category 3 Components not covered by cat. 1 or cat. 2, with foreseeable skin contact up to 30 s (short-term skin contact)
		Toys / other Products	Toys / other Products
Benzo[a]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[e]phyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[a]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[b]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[j]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[k]fluoranthen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Chrysen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Dibenzo[a,h]anthracen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Benzo[ghi]perylen	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Indeno[1,2,3-cd]pyren	< 0,2	<0,2 / < 0,5	< 0,5 / < 1
Acenaphthylen, Acenapthen, Fluoren, Phenanthren, Pyren, Anthracen, Fluoranthen	< 1 Sum	< 5 / < 10 Sum	< 20 / < 50 Sum
Napthalin	< 1	< 2	< 10
Sum 18 PAH	< 1	< 5 / < 10	< 20 / < 50

Remark: the tested components were chosen by the customer.

Stated results and evaluations are solely related to tested items. Findings comply with the above stated requirements and recommendations.

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(a) = Accredited analysis
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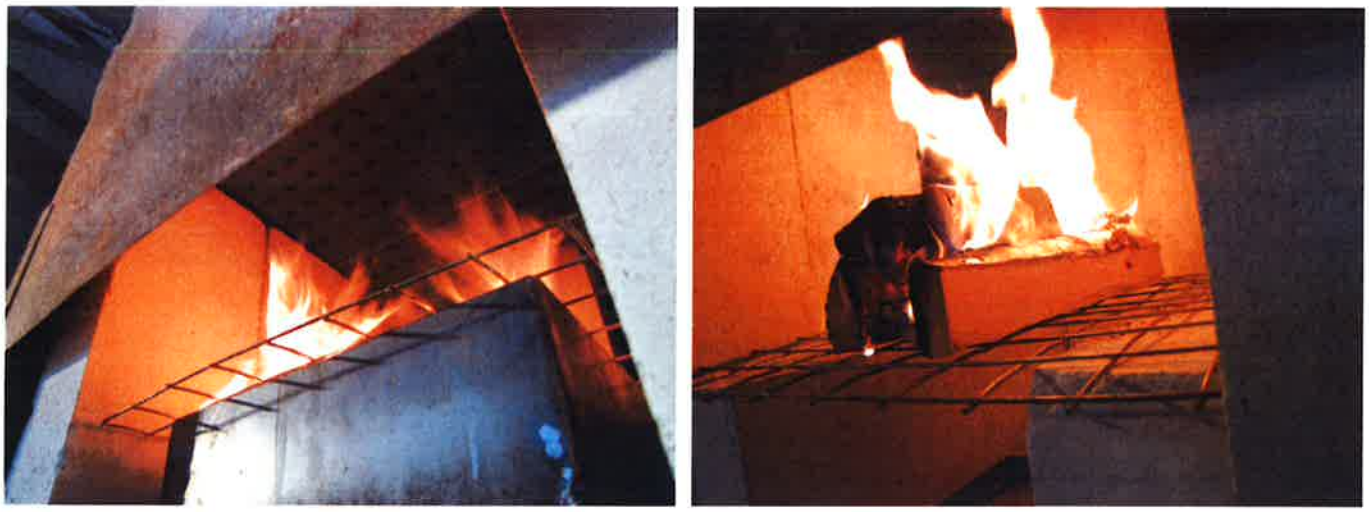
Photographs

Picture 1. Picture of some samples. All samples had a different amount of the two main materials and luminous badges on the fabric.

Picture 2. Picture of the test set-up (the sample contamination chamber).

Picture 3. Picture of the smoke contamination chamber during the contamination phase (wood burning phase).



Picture 4. Picture of the smoke contamination chamber during the contamination phase (wood burning phase on the right hand side and oil+ plastic burning phase on the left hand side).