Bremer Umweltinstitut

REPORT

1 Description of order

Client:	Bont voor Dieren to Mrs. Zandberg Derde Oosterparkstraat 271 1092 EA Amsterdam The Netherlands
Date of order:	26-11-2015
Agent:	Bremer Umweltinstitut Gesellschaft für Schadstoffanalysen und Begutachtung mbH Fahrenheitstraße 1 28359 Bremen
Number of report:	K 2399 FL I
Related analysis reports:	K 2399 FL from 09-12-2015
Creation date:	11.12.2015
Purpose / aim:	Six fur samples as facing of various clothes ought to be determined for burden with formaldehyde, polycyclic aromatic hydrocarbons, hexavalent chromium, alkyl phenols and alkyl phenol ethoxylates.

2 Summary

All six investigated fur patterns are loaded with formaldehyde (33-260 mg/kg), with nonylphenol ethoxylates (44-3100 mg/kg) and in two samples (fur jacket Canada Goose and fur Nikcelon Amara) with octylphenolethoxylates (7 and 12 mg/kg). Nonylphenol was detected in fur "from market (airforce)" and in fur "jacket Canada Goose" (9 and 4 mg/kg). Hexavalent chromium was not detected in any of the furs. The total amount of load with PAK was 0.05 to 1.42 mg/kg.

3 Evaluation

3.1 Evaluation of formaldehyde

Formaldehyde is a gas with a sweetish to pungent smell that exhibits cell damaging and mutagenic effects. For sensitive individuals already low ambient air concentrations cause irritation of the mucous membranes (from 12 to 60 ug/m^3 corresponds to 0.01 to 0.05 ppm) and high concentrations may elicit hypersensitivity in case of dermal contact.

In a statement from June 2007 by the Federal Institute for Risk Assessment (BfR), a provocation of allergic reactions can not completely excluded with low levels of formaldehyde in textile.
Formaldehyde was already classified as a human carcinogen in 2004 by the World Health Organization (WHO). In a toxicological revaluation, also the Federal Institute for Risk Assessment (BfR) classified formaldehyde as human carcinogen in 2006.
With the regulation (EU) no. 605/2014 from the 5th of June 2014, the regulation (EC) no. 1272/2008 (CLP-V) was currently modified in Europe. Thus, formaldehyde is classified to the categories C1B and M2 (may cause cancer, suspected of causing genetic defects).

Textiles with mass contents of more than 0.15 % (1500 mg/kg) of free formaldehyde that are in dermal contact within intended use, have to be labeled, concerning the German consumer goods ordinance (annex 9).

Basing on the Toy Safety Directive (Directive 2009/48/EC) and on relevant European standards of series EN 71, textile components of toys intended for children under 3 years, must not contain more than 30 mg/kg formaldehyde (free and hydrolysed).

Due to the harmful relevance of formaldehyde, critical organizations like the IVN (International Association of Natural Textile Industry) agreed in their demands for residues in goods for precautionary reasons, to a preferably low formaldehyde value. Concerning the IVN guideline for textiles, no more than 16 mg/kg of formaldehyde are allowed in prior sale, for leather a maximum value of 50mg/kg is pretended.

The SG quality label of the TÜV Rheinland GmbH, the Institute Fresenius GmbH and the Test and Research Institute Pirmasens eV (PFI) requires the compliance with max. 100 mg/kg for furs without dermal contact, max. 75 mg/kg for furs with dermal contact and not more than 20 mg/kg of formaldehyde for products for toddlers (about 36 months). The eco-label "Blauer Engel" also use these reference values (RAL-UZ 155 for shoes: 20 mg/kg for finished products for babies and toddlers, 75 mg/kg for other products).

The Oeko-Tex Standard 100 describes an upper limit for formaldehyde in textile products of 16 mg/kg for babies, 75 mg/kg for fabrics with physical contact and 300 mg/kg without physical contact.

Overall, the proven formaldehyde concentrations in the determined furs are not subjected to labeling yet, but classified as remarkably high in most of the cases.
According to the evaluation criteria of the GOTS, none of the investigated furs would be allowed to receive the quality label of the association, concerning formaldehyde. Only one fur complies with the requirements of the SG-label (if physical contact is assumed).

Formaldehyde is a compound with carcinogenic potential. The Bremer Umweltinstitut recommends a minimization of this compound in children's clothing in order to avoid health hazards, as even at low concentrations allergenic effects of formaldehyde can not be safely excluded.

3.2 Evaluation of alkylphenols and alkylphenolethoxylates

Alkylphenolethoxylates (APEO) belong to the group of the non ionic tensides with emulsifying resp. dispersing effects (surfactant effect). They consist of an isomeric mixture of alkylphenols with substituted ethoxylate units of different chain lengths. They are frequently used as detergent substances in textile or leather auxiliaries (as well as in softeners, color fixations, drying agents, binders, oils,…). They are also used as a tool for the production of plastics, lacquers or colors.
The most relevant compounds considering the production volume and the toxicology are the nonyl- and octylphenolethoxylates which can degraded in the sewage to the fish toxic compounds nonylphenol and octylphenol. Nonylphenol is considered readily biodegradable and has hormonal effects. It can accumulate in the tissue of fish and further organisms and finally reach the food chain. According to the CLP-VO (EG 1272/2008, table 3.1) it has been classified as toxic for reproduction in category R2.

The industrial use of nonyl- and octylphenolethoxylates is not permitted in the European union. According to the German "Gefahrstoffverordnung" and REACH regulation (EG 1907/2006) nonylphenolethoxylates are neither allowed as a substance nor as a preparation for the textile and leather processing with a content of above 0,1% (1000 mg/kg).
The use of pesticides or biocides containing nonylphenol ethoxylates as co-formulant is, however, permitted without any restrictions in their content if registered before 17th of June 2003.

Since 20th of June 2013 nonylphenolethoxylates are listed in the candidate list of the ECHA (European Chemicals agency) for substances of very high concern (SVHC). The SVHC lists health or environmentally

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hazardous substances which can be supplied for later admission procedure or limitation procedure. If a product contains more than 1000 mg/kg of one or more of the listed substances all suppliers and producers from the EU have to inform both their commercial customers as well as the consumer about the use and the potential hazard. In addition, the ECHA has to be informed if the production volume is above one ton per year with a content of more than 1%.

In their directives for textile and leather, the IVN (International Association of Natural Textile Industry) and the international working group from the Global Organic Textile Standard (GOTS) claim the exclusion of nonyl- and octylphenols and the corresponding ethoxylates for textile and leather production. In the latest GOTS version the total limit value for residues of alkylphenols (AP) and alkylphenolethoxylates (APEO) in textiles is 20 mg/kg. The IVN sets this value in their leather directive to 100 mg/kg. The SG quality label states a limit value for alkylphenols and alkylphenolethoxylates in fur of 500 mg/kg each.

The limit mentioned in Oeko-Tex standard 100 is set to 10 mg/kg for the sum of octylphenol and nonylphenol and 100 mg/kg for the sum of octyl- and nonylphenolethoxylates and octylphenols and nonylphenols. Further labels demand a restriction of these compounds in their products too (e.g. bluesign: Consumer safety limit for OP, NP, NPEO and OPEO each 10 mg/kg).

In their detox campaign, the environmental organization Greenpeace even states the complete abandonment of the use of hazardous substances (this includes AP and APEO) and sets a zero limit for the final product.

All six furs are burdened with nonylphenolethoxylates (between 44 mg/kg and 3100 mg/kg). The industrial use of these compounds is prohibited within the European union, however, imported products are not statuarily regulated. Customers and users only have a right of information on request for the substances included in the candidate list and with a proven content in the product of more than 1000 mg/kg.
None of the investigated samples meets the criteria of the IVN or GOTS. Only one fur could be certified with respect to the Oeko-Tex standard concerning the AP and APEO.

The investigations show clear to very high concentration of alkylphenolethoxylates which do not indicate a good manufacturing practice compared with the criteria catalogs of critical commercial organizations.
The renunciation of the manufacturer concerning the use of alkylphenolethoxylates like it is demanded from greenpeace and several organizations (IVN, GOTS) is not recognizable in the fur industry.

If you have any further questions please do not hesitate to contact us.

This examination is only valid to the tested material mentioned in report K 2399 FL. This report must not be published partially, only completely.

With best regards
Bremer Umweltinstitut

Ulrike Siemers,
Dipl.-Ing. Chemietechnik (FH)

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ANALYSIS REPORT

1 Description of order

Client: Bont voor Dieren
Mrs. Zandberg
Derde Oosterparkstraat 271
1092 EA Amsterdam
Niederlande

Date of order: 26-11-2015

Agent: Bremer Umweltinstitut
Gesellschaft für Schadstoffanalysen und Begutachtung mbH
Fahrenheitstraße 1
28359 Bremen

Number of report: K 2399 FL

Sample receipt: 26-11-2015

Sample period: 01-12-2015 bis 09-12-2015

Sampling: The samples were taken and sent by Meike Sjoer,Verslaggever Kassa

1.1 Description of samples

sample number	article	test intention
K 2399 FL - 1	*sample* Brand: Canada Goose babyboys Elijah Jacket, Pelz: Coyote, Age: 18 months 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)

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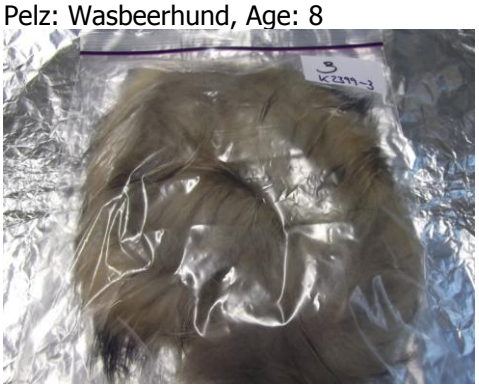
sample number	article	test intention
K 2399 FL - 2	*sample* Brand: AirForce 2 pocket Classic Parka, Pelz: Wasbeerhund, Age: 10 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)
K 2399 FL - 3	*sample* Brand: Woolrich Girl Parka, Pelz: Wasbeerhund, Age: 8 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)
K 2399 FL - 4	*sample* Brand: Versano Milan, Pelz: Wasbeerhund, Age: 2 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)

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sample number	article	test intention
K 2399 FL - 5	*sample* Brand: Nickelon Amara jr. Girl, Pelz: Wasbeerhund, Age: 10 (Size 140) 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)
K 2399 FL - 6	*sample* Brand: from Market (airforce), Pelz: Wasbeerhund, Age: 10 Monate 	- alkylphenols (AP) and ethoxylated alkylphenols (APEO) - chromium VI - formaldehyde - polycyclic aromatic hydrocarbons (PAH)

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2 Methods

2.1 Test method for analysis of nonyl phenols and octyl phenols

Referring to DIN EN ISO 18218-2:2015-11
1. Extraction with acetonitrile by ultrasonic bath
2. Quantitative examination with GC-MS

2.2 Test method for analysis of ethoxylated nonyl phenols and octyl phenols

Referring to DIN EN ISO 18218-2:2015-11
1. Extraction with acetonitrile by ultrasonic bath
2. Conversion into NP and OP with aluminium triiodide as cleavage agent
2. Quantitative examination based on Ethylan 77 and Triton X 100 with GC-MS

2.3 Test method for analysis of chromium VI

The test is carried out according to ASU B 82.02-11:2008-10, in dependence on DIN EN ISO 17075:2008-2

2.4 Test method for analysis of formaldehyde

In accordance to DIN EN ISO 17226-1:2008-8

2.5 Test method for analysis of polycyclic aromatic hydrocarbons (PAH)

1. Extraction by Soxhlet with toluene
2. Filtration by mini-silicagel column
3. Separation, identification and quantification with capillary gas chromatography GC/MS

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3 Results

3.1 Result of alkylphenols and ethoxylated alkylphenols

Parameter	**K 2399 FL - 1** Brand: Canada Goose babyboys Elijah Jacket, Pelz: Coyote **[mg/kg]**	**K 2399 FL - 2** Brand: AirForce 2 pocket Classic Parka, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 3** Brand: Woolrich Girl Parka, Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
Nonylphenols	4	n.d.	n.d.	3	50	
Oktylphenols	n.d.	n.d.	n.d.	3	∑ 100	∑ 20
Ethoxylated nonylphenols	680	490	44	5		
Ethoxylated oktylphenols	7	n.d.	n.d.	5		

Parameter	**K 2399 FL - 4** Brand: Versano Milan, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 5** Brand: Nickelon Amara jr. Girl, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 6** Brand: from Market (airforce), Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
Nonylphenols	n.d.	n.d.	9	3	50	
Oktylphenols	n.d.	n.d.	n.d.	3	∑ 100	∑ 20
Ethoxylated nonylphenols	990	290	3100	5		
Ethoxylated oktylphenols	n.d.	12	n.d.	5		

n.d. = not detected mg/kg = milligram per kilogram DL = detection limit
IVN = Internationaler Verband der Naturtextilwirtschaft e.V., Richtlinie Naturleder, Version 3.0
GOTS = Global Organic Textile Standard, Version 4.0

3.2 Results of chromium VI

Parameter	**K 2399 FL - 1** Brand: Canada Goose babyboys Elijah Jacket, Pelz: Coyote **[mg/kg]**	**K 2399 FL - 2** Brand: AirForce 2 pocket Classic Parka, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 3** Brand: Woolrich Girl Parka, Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**
chromium VI	n.d.	n.d.	n.d.	3	≤ 3

Parameter	**K 2399 FL - 4** Brand: Versano Milan, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 5** Brand: Nickelon Amara jr. Girl, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 6** Brand: from Market (airforce), Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**
chromium VI	n.d.	n.d.	n.d.	3	≤ 3

n.d. = not detected mg/kg = milligram per kilogram DL = detection limit
IVN = Internationaler Verband der Naturtextilwirtschaft e.V., Richtlinie Naturleder, Version 3.0

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3.3 Results of formaldehyde

Parameter	**K 2399 FL - 1** Brand: Canada Goose babyboys Elijah Jacket, Pelz: Coyote **[mg/kg]**	**K 2399 FL - 2** Brand: AirForce 2 pocket Classic Parka, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 3** Brand: Woolrich Girl Parka, Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
formaldehyde	240	180	33	3	≤ 50	< 16

Parameter	**K 2399 FL - 4** Brand: Versano Milan, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 5** Brand: Nickelon Amara jr. Girl, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 6** Brand: from Market (airforce), Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
formaldehyde	260	160	160	3	≤ 50	< 16

n.d. = not detected mg/kg = milligram per kilogram DL = detection limit
IVN = Internationaler Verband der Naturtextilwirtschaft e.V., Richtlinie Naturleder, Version 3.0
GOTS = Global Organic Textile Standard, Version 4.0

3.4 Results of PAH

Parameter	**K 2399 FL - 1** Brand: Canada Goose babyboys Elijah Jacket, Pelz: Coyote **[mg/kg]**	**K 2399 FL - 2** Brand: AirForce 2 pocket Classic Parka, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 3** Brand: Woolrich Girl Parka, Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
Naphthalene	n.d.	n.d.	0,05	0,02	-	< 1,0
Acenaphthelene	n.d.	n.d.	n.d.	0,02	-	< 1,0
Acenaphthene	n.d.	n.d.	n.d.	0,02	-	< 1,0
Fluorene	n.d.	n.d.	n.d.	0,02	-	< 1,0
Phenanthrene	0,05	0,07	0,06	0,05	-	< 1,0
Anthracene	n.d.	n.d.	n.d.	0,05	0,1	< 1,0
Fluoranthene	n.d.	n.d.	n.d.	0,05	-	< 1,0
Pyrene	n.d.	0,06	0,06	0,05	-	< 1,0
Chrysene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(a)anthracene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(b)fluoranthene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(j)flouranthene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(k)fluoranthene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(e)pyrene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(a)pyrene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Indeno(1,2,3-cd)pyrene	n.d.	n.d.	n.d.	0,1	-	< 1,0
Dibenzo(,h)anthracene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(ghi)perylene	n.d.	0,1	n.d.	0,1	-	< 1,0
Sum PAH	**0,05**	**0,13**	**0,17**		**5**	**< 10**

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Parameter	**K 2399 FL - 4** Brand: Versano Milan, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 5** Brand: Nickelon Amara jr. Girl, Pelz: Wasbeerhund, **[mg/kg]**	**K 2399 FL - 6** Brand: from Market (airforce), Pelz: Wasbeerhund, **[mg/kg]**	**DL** **[mg/kg]**	**require-ments IVN leather** **[mg/kg]**	**require-ments GOTS** **[mg/kg]**
Naphthalene	0,13	n.d.	n.d.	0,02	-	< 1,0
Acenaphthelene	n.d.	n.d.	n.d.	0,02	-	< 1,0
Acenaphthene	n.d.	n.d.	n.d.	0,02	-	< 1,0
Fluorene	n.d.	n.d.	0,06	0,02	-	< 1,0
Phenanthrene	0,21	0,30	0,31	0,05	-	< 1,0
Anthracene	n.d.	n.d.	n.d.	0,05	0,1	< 1,0
Fluoranthene	0,07	0,35	0,12	0,05	-	< 1,0
Pyrene	0,08	0,29	0,29	0,05	-	< 1,0
Chrysene	n.d.	0,11	0,07	0,05	0,2	< 1,0
Benzo(a)anthracene	n.d.	0,14	0,17	0,05	0,2	< 1,0
Benzo(b)fluoranthene	n.d.	0,07	n.d.	0,05	0,2	< 1,0
Benzo(j)flouranthene	n.d.	n.d.	n.d.	0,05	0,2	< 1,0
Benzo(k)fluoranthene	n.d.	0,06	n.d.	0,05	0,2	< 1,0
Benzo(e)pyrene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(a)pyrene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Indeno(1,2,3-cd)pyrene	n.d.	n.d.	n.d.	0,1	-	< 1,0
Dibenzo(,h)antrhacene	n.d.	n.d.	n.d.	0,1	0,2	< 1,0
Benzo(ghi)perylene	n.d.	0,1	n.d.	0,1	-	< 1,0
Sum PAH	**0,49**	**1,42**	**1,02**		**5**	**< 10**

n.d. = not detected mg/kg = milligram per kilogram DL = detection limit
IVN = Internationaler Verband der Naturtextilwirtschaft e.V., Richtlinie Naturleder, Version 3.0
GOTS = Global Organic Textile Standard, Version 4.0

- End of the ANALYTICAL REPORT -

This examination is only valid in relation to the tested material. This report must not be published partially, only completely.

With best regards
Bremer Umweltinstitut

Ulrike Siemers,
Dipl.-Ing. Chemietechnik (FH), Test director