DANISH MINISTRY
OF THE ENVIRONMENT
Environmental
Protection Agency

Phthalates in products with large surfaces

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Survey of Chemical Substances in Consumer Products, No. 108 2010

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Content

Preface

The project called ”Phthalates in products with large surfaces” was carried out from April 2010 till June 2010.

This report describes the project results, including a survey and chemical analyses of a number of selected products.

As a starting point, a survey was carried out on number of consumer products on the Danish market that might contain phthalates. Subsequently, quantitative analyses and migration analyses were carried out on a number of selected products.

The project was carried out by Danish Technological Institute with Kathe Tønning (MA) as project manager and Nils Nilsson (PhD), Eva Jacobsen (MSc) and Eva Pedersen (laboratory technician) as project co-workers.

The project was followed by a reference group consisting of the following persons:

- Shima Dobel, the Danish Environmental Protection Agency
- Maria Mostrup Scheel, the Danish Environmental Protection Agency
- Kathe Tønning, Danish Technological Institute
- Nils Nilsson, Danish Technological Institute
- Eva Pedersen, Danish Technological Institute.

The project was financed by the Danish Environmental Protection Agency.

Summary and conclusions

Since 2001, a wide range of projects have been carried out with the objective to estimate risks when using a number of different product groups. In 2008/2009, a project concerning the total exposure of 2-year-olds to chemical substances was carried out. The project demonstrated that the exposure of children to phthalates can form a risk when the total exposure from foodstuffs, indoor climate and consumer products is considered.

It is on that basis, the current project concerning phthalates in products that contribute to the exposure of children to phthalates through the indoor climate was initiated.

In the project, focus was on the four phthalates DEHP, BBP, DBP and DIBP that are classified as toxic for reproduction.

Chapter 2 contains the survey of products with large surfaces, which are expected to contain phthalates.

The following product groups are comprised by the survey:

- floor covering
- wall lining
- furniture
- curtains
- lamp shades
- mattresses
- shower curtains
- oilcloth and dinner mats
- balance balls.

Besides identifying products within the above product categories, products for further analysis were selected and purchased. 102 products were selected and purchased for chemical analysis.

The products are distributed on 16 floor coverings (vinyl based/vinyl coated floor covering and carpets with rubber backside), 15 wall linings (vinyl wallpapers), 15 furniture (covered with leatherette), one curtain (venetian blind), 10 lamp shades, 10 shower curtains, 13 air beds, 12 oil cloths and mats and 10 balance balls.

The selected 102 products from the survey has been analysed quantitatively for the four selected phthalates DIBP, DBP, BBP and DEHP. A subsample of the products was extracted with dichloromethane and analysed by gaschromatography with massespektroscopic detection (GC-MS).

The results have been calculated in the units mg/kg, weight percent (m/m) and as g/m^2.

There was found high concentrations of DEHP and DIBP in some product groups. This is the case for furniture, shower curtains, airbeds, oilcloth and dinner mats and balance balls.

For the product group floor covering only one product contained one of the four phthalates (DIBP) in more than 1 % (m/m). For wall linings one or two of the four phthalates were present in 11 products (except BBP) but in very low concentrations (0.001-0.005 % (m/m)). The same was the case for lamp shades. In the lamp shades low concentrations of DIBP, DBP or DEHP were present in five products (0.004-0.21 % (m/m)).

In Table 0.1 the number of products in each product group analysed are listed together with the amount of products where one or more of the four selected phthalates have been found.

In Table 0.2 a number of the analysed products with content higher than 1 % (m/m) are listed together with the concentration interval found. In some products other phthalates than DEHP, BBP, DBP and DIBP were found, e.g. DINP. Other phthalates are not quantified.

Table 0.1 Survey over products with a content of one or more of the four phthalates

Product group	Number of products analysed	Number of products with one or more of the four phtalater
Floor covering	16	5
Wall lining	15	11
Furniture	15	12
Curtains	1	0
Lamp shades	10	5
Shower curtains	10	8
Airbeds	13	11
Oilcloth and dinner mats	12	10
Balance balls.	10	8

Table 0.2 Survey over products with a content of phthalates higher than 1 %(m/m) and in parenthesis in g/m^2 and with information on type of phthalate and concentration interval found in %

Product group	Number of products	DIBP	DEHP
Floor covering	1	7.4 (125)	
Wall lining	None		
Furniture	9	1.6(13.2)	7.2-39.2 (32-180)
Curtains	None		
Lamp shades	None		
Mattresses	6		1.1-28.2(1.5-59.1)
Shower curtains	4		8.2-30.4 (38.7-88.2)
Oilcloth and dinner mats	4		13.0-25.3 (49.1-87.9)
Balance balls.	4	10.9-35.4 (245-452)	43.9-44.2 (556-598)

Sammenfatning og konklusioner

Miljøstyrelsen gennemførte i 2008/2009 et projekt om 2-åriges samlede udsættelse for kemiske stoffer. Dette projekt viste, at børns udsættelse for ftalater kan udgøre en risiko, når der ses på den samlede udsættelse for både fødevarer, indeklima og forbrugerprodukter.

På denne baggrund er nærværende projekt igangsat med det formål at få belyst, hvilke produkter der bidrager væsentligt til børns udsættelse for ftalater i indeklimaet. I projektet er det tilstræbt at identificere produkter med store overflader og med indhold af en eller flere af de fire ftalater DEHP, BBP, DBP og DIBP, der alle er klassificeret som reprotoksiske.

Af kapitel **Fejl! Henvisningskilde ikke fundet.** fremgår kortlægningen af produkter med store overflader, som må forventes at indeholde ftalater.

Følgende produktgrupper er omfattet af kortlægningen:

- gulvbelægning
- vægbeklædning
- møbler
- gardiner
- lampeskærme
- madrasser
- badeforhæng
- voksdug og dækkeservietter
- pilatesbolde.

Ud over at identificere produkter inden for ovenstående produktkategorier er produkter til videre analyse udvalgt og indkøbt. Der er udvalgt og indkøbt 102 produkter til kemisk analyse.

Produkterne fordeler sig med 16 gulvbelægninger (vinylbaserede gulvbelægninger og gulvtæpper med gummibagside), 15 vægbeklædninger (vinyltapeter), 15 møbler (beklædt med kunstlæder), et gardin (persienne), 10 lampeskærme, 10 badeforhæng, 13 luftmadrasser, 12 voksduge og dækkeservietter og 10 pilatesbolde.

De udvalgte 102 produkter fra kortlægningen er analyseret kvantitativt for de fire udvalgte ftalater DIBP, DBP, BBP og DEHP. En delprøve af produkterne er ekstraheret med dichlormethan og analyseret ved gaschromatografi/ massespektrometri (GC/MS).

Resultaterne er udregnet i enhederne mg/kg, vægtprocent (m/m) og som g/m^2.

Der er påvist høje koncentrationer af DEHP og DIBP i nogle produktgrupper. Det gælder produktgrupperne møbler, badeforhæng, luftmadrasser, voksdug og pilatesbolde.

For produktgruppen gulvbelægninger var der kun et produkt, der indeholdt en af de fire ftalater (DIBP) i mere end 1 % (m/m). For vægbeklædninger var

der i 11 produkter en eller to af de fire ftalater til stede (dog ikke BBP), men i meget lave koncentrationer (0,001-0,005 % (m/m)). Det samme var tilfældet for 5 af lampeskærmene. Her var DIBP eller DBP til stede i lave koncentrationer (0,004-0,21 % (m/m)).

Tabel 0.1 er antal produkter med påvist indhold af en eller flere af de fire ftalater listet i forhold til det totale antal analyserede produkter fra hver produktgruppe, og i Tabel 0.2 er antal produkter fra hver produktgruppe med større indhold end 1 % (m/m) angivet samt koncentrationsinterval. I parentes er angivet intervallet i g/m^2. I flere produkter fandtes andre ftalater end de fire udvalgte DIBP, DBP, BBP og DEHP, eksempelvis DINP. Andre ftalater er dog ikke kvantificeret.

Tabel 0.1 Oversigt over produkter med indhold af de fire ftalater

Produktgruppe	Antal produkter analyseret	Antal produkter med en eller flere af de fire ftalater
Gulvbelægninger	16	5
Vægbeklædninger	15	11
Møbler	15	12
Gardiner	1	0
Lampeskærme	10	5
Badeforhæng	10	8
Luftmadrasser	13	10
Voksdug og dækkeservietter	12	11
Pilatesbolde	10	8

Tabel 0.2 Oversigt over produkter med indhold af ftalater større end 1 % (m/m) og i parentes g/m^2 og med angivelse af typer af ftalater og koncentrationsinterval i %

Produktgruppe	Antal produkter	DIBP	DEHP
Gulvbelægninger	1	7,4 (125)	
Vægbeklædninger	ingen		
Møbler	9	1,6(13,2)	7,2-39,2 (32-180)
Gardiner	Ingen		
Lampeskærme	Ingen		
Badeforhæng	6		1,1-28,2(1,5-59,1)
Luftmadrasser	4		8,2-30,4 (38,7-88,2)
Voksdug og dækkeservietter	4		13,0-25,3 (49,1-87,9)
Pilatesbolde	4	10,9-35,4 (245-452)	43,9-44,2 (556-598)

1 Introduction

The project carried out by the Danish Environmental Protection Agency concerning the exposure of 2-year-olds to chemical substances demonstrated that the exposure of children to phthalates can form a risk when the total exposure from foodstuffs, indoor climate and consumer products is considered.

That is why a number of consumer products available on the Danish market were investigated. The project deals with products with large surface area. It is examined to what extent they contain phthalates that may contribute to the exposure of children to phthalates in the indoor climate.

In the project, focus was on the four phthalates called DEHP, BBP, DBP and DIBP that are classified as toxic for the reproduction.

2 Survey

2.1 Objective of the survey

The objective of the survey was to identify a number of consumer products on the Danish market. The following product groups are in question:

- floor covering
- wall covering
- furniture
- curtains
- lamp shades
- shower curtains
- mattresses
- oil cloths and dinner mats
- balance balls.

Besides identifying products within the above product groups, the objective of the survey was to procure products for chemical analyses.

The survey only comprised products that are marketed in Denmark or sold on Danish internet pages.

In the following, the survey is described separately for each product group.

2.2 Delimitation

The delimitation of each product group is described separately in the study of each product group.

2.3 Floor covering

2.3.1 Delimitation

The product group called floor covering was limited to vinyl based or vinyl coated floor coverings and carpets with rubber back.

2.3.2 Procedure

The survey of floor covering was carried out in April and May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with vinyl based or vinyl coated floor covering and carpets with rubber back were visited.

2.3.3 Shop visits

Visits were paid to a wide range of shops, including:

- Interior design shops/furniture stores
- DIY retailers
- carpet shops/floor covering shops
- supermarkets/discount warehouses.

In addition, catalogues, advertising brochures etc. were examined.

2.3.4 Internet visits

Searching took place on Google with different search words and word combinations such as e.g. ”vinyl, PVC, gulve, tæpper, gummibagside” (vinyl, PVC, floors, carpets, rubber back) in order to find a number of internet shops that sell vinyl based/vinyl coated floor covering and carpets with rubber back.

2.3.5 Results of survey

There was a very large and varied supply of vinyl based/vinyl coated floor covering and also a large supply of carpets with rubber back.

Some vinyl based/vinyl coated floor coverings are marketed as tiles, but the majority are sold by the meter (200 cm, 300 cm and 400 cm in width).

Plain coloured and patterned floor covering was registered as well as floor covering mimicking stone tile, natural tile, parquet floor, plank floor etc.

In most cases there was a variety of patterns within the individual brands.

2.3.6 Results of shop visit

Vinyl based/vinyl coated floor covering and carpets with rubber back were registered in all of the shop types visited.

One of the visited shops had an extraordinary large and varied supply – more than 50 patterns of vinyl floor covering sold by the meter.

A large number of wool carpets with rubber back were also registered. Furthermore a large number of PP, polyamide and sisal carpets with rubber back were registered.

A factory in Denmark produced rubber back for a number of carpet producers. There is – according to the staff in one of the visited shops – a single carpet factory that produces its own rubber back.

2.3.7 Results of survey via internet pages

A large supply of vinyl based/vinyl coated floor coverings and carpets with rubber back were registered in the visited internet shops.

2.3.8 Selected products

Table 2.1 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

16 vinyl based/vinyl coated floor coverings and carpets with rubber back were selected, including:

- 1 vinyl tile
- 4 vinyl floor coverings sold by the meter
- 3 vinyl coverings in the shape of panels
- 8 carpets with rubber back.

A total of 16 vinyl based/vinyl coated floor coverings and carpets with rubber back were purchased; 14 products from physical shops and 2 products from internet shops.

The selection of the vinyl based/vinyl coated floor covering and carpet with rubber back in the physical shops was done based on information from the shop staff on the type of material with regards to the carpets a visual assessment of the material of the back.

The selection of the vinyl based/vinyl coated floor coverings and carpets with rubber back from the internet shops was based on the information each shop had about the product.

Another criterion for the selection of products was a wish for inexpensive as well as more expensive products.

When selecting vinyl based/vinyl coated floor covering and carpets with rubber back it was in general considered which products the shop staff considered popular.

A single carpet tile with glue on the back was selected, as glue experientially can contain plasticisers.

The following vinyl based/vinyl coated floor coverings and carpets with rubber back were purchased.

Table 2.1 Purchased products – vinyl based/vinyl coated floor coverings and carpets with rubber back

No.	Type	Brief description	Shop type
2-55	Vinyl covering panels	Tile motif	DIY retailer
2-56	Vinyl covering panels	Parquet motif	DIY retailer
2-32	Carpet with rubber back	Synthetic bordeaux carpet with very smooth rubber back	DIY retailer
2-33	Vinyl covering sold by the meter	Tile motif	DIY retailer
2-34	Carpet with rubber back	Dark Grey PP needle boucle pile	Carpet shop
2-35	Vinyl covering sold by the meter	Parquet motif	Carpet shop
2-36	Carpet with rubber back	Flecked beige PP pile	Carpet shop
2-37	Carpet with rubber back	Flecked light grey wool pile	Carpet shop
2-38	Vinyl covering sold by the meter	Parquet motif	Carpet shop
2-39	Vinyl covering sold by the meter	Tile motif	Carpet shop
2-40	Carpet tile with glue back	Black carpet tile	Carpet shop
2-54	Carpet with rubber back	Beige sisal pile	Carpet shop
2-61	Carpet with rubber back	Play motif with roads. Polyamide pile	Carpet shop
2-60	Carpet with rubber back	Flecked grey PP pile	Carpet shop
2-78	Vinyl tile	Black tile	Internet shop
2-80	Vinyl covering panels	Plank floor motif	Internet shop

2.3.9 Product prises

During the survey, vinyl based/vinyl coated floor coverings and carpets with rubber back were registered in a price range from 3.99 to 133.20 per square meter.

2.4 Wall lining

2.4.1 Delimitation

The product group called wall lining was limited to vinyl wallpapers.

2.4.2 Procedure

The survey of wallpapers was carried out in May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with wallpapers were visited.

2.4.3 Shop visits

Visits were paid to a wide range of shops, including:

- paint stores
- interior design shops/furniture stores
- DIY retailers
- carpet shops
- supermarkets/discount warehouses.

In addition, catalogues, advertising brochures etc. were examined.

2.4.4 Internet visits

Searching took place on Google with different search words and word combinations such as e.g."tapet, vægbeklædning, vinyl, PVC, smudsafvisende" (wallpaper, wall lining, vinyl, PVC, dirt-repelling) in order to find a number of internet shops that sell this group of products.

2.4.5 Results of the survey

A large number of vinyl wallpapers were registered.
Both plain coloured and patterned vinyl wallpapers were registered.

2.4.6 Results of shop visits

Vinyl wallpapers were registered in all of the shop types visited.

The largest supply of vinyl wallpaper was registered in the paint stores.

In one of the paint stores the staff stated that vinyl wallpapers are very popular and that they are not only used in kitchens and baths but in all types of rooms.

2.4.7 Results of survey via internet pages

A large supply of vinyl wallpapers were also registered in the visited internet shops.

2.4.8 Selected products

Table 2.2 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

15 vinyl wallpapers were selected.

12 products were purchased from physical shops and 3 products from internet shops.

The selection of the wallpapers in the physical shops was done based on information from wallpaper wrapping and wallpaper books as well as information from the shop staff on the type of material.

The selection of products from the internet shops was based on the information each shop had about the product.

Another criterion for the selection of products was a wish for inexpensive as well as more expensive products.

When selecting wallpapers it was in general considered which products the shop staff considered popular.

The following vinyl wallpapers were purchased.

Table 2.2 purchased products – Vinyl wallpapers

No.	Type	Brief description	Shop type
2-11	Vinyl wallpaper	Blue wallpaper with stars that glow in the dark	DIY retailer
2-12	Vinyl wallpaper	White wallpaper	DIY retailer
2-13	Vinyl wallpaper	Beige wallpaper	DIY retailer
2-14	Vinyl wallpaper	White wallpaper with red pattern	DIY retailer
2-15	Vinyl wallpaper	Black wallpaper with red pattern	Paint store
2-16	Vinyl wallpaper	White wallpaper with sketched flowers	Paint store
2-17	Vinyl wallpaper	Red wallpaper with mosaic pattern	Paint store
2-18	Vinyl wallpaper	Purple wallpaper	Paint store
2-19	Vinyl wallpaper	White wallpaper with hot air balloons	Paint store
2-20	Vinyl wallpaper	Black wallpaper with white flowers	Paint store
2-21	Vinyl wallpaper	Black wallpaper with flowers and ladybirds	Paint store
2-22	Vinyl wallpaper	White wallpaper with multi coloured circles	Paint store
2-74	Vinyl wallpaper	White wallpaper with dragons	Internet shop
2-75	Vinyl wallpaper	Black wallpaper with white line pattern	Internet shop
2-76	Vinyl wallpaper	White wallpaper with black flowers	Internet shop

2.4.9 Product prices

During the survey, wallpapers were registered in a price range from 6.53 to 119.73 per role.

2.5 Furniture

2.5.1 Delimitation

The product group called furniture was limited to furniture covered with leatherette.

2.5.2 Procedure

The survey of furniture was carried out in April and May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with furniture were visited.

In consideration of the project economy, the survey has primarily included chairs (dining table chairs, easy chairs, bar stools, bean back chairs and poufs), meanwhile couches are not included in this survey.

2.5.3 Shop visits

Visits were paid to a wide range of shops, including:

- Furniture stores
- interior design shops
- discount chain for furniture and textiles
- supermarkets/discount warehouses.

In addition, catalogues, advertising brochures etc. were examined.

2.5.4 Internet visits

Searching took place on Google with different search words and word combinations such as e.g.”møbler, stol, puf, lænestol, læderlook, imiteret læder” (furniture, chairs, footstool, easy chair, leatherette, leather look, imitated leather) in order to find a number of internet shops that sell this group of products.

2.5.5 Results of survey

Furniture covered with leatherette was registered in all of the different shop types visited.

2.5.6 Results of shop visits

A very large and varied supply of furniture covered with leatherette was registered. Many of the products were in the same price range, though with some distribution.

2.5.7 Results of survey via internet pages

Many of the physical shops also feature an internet shop, where the supply is more limited than in the physical shops.

2.5.8 Selected products

Table 2.3 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

15 pieces of furniture covered with leatherette were selected.

14 products were purchased from physical shops and 1 product from an internet shop.

The selection of furniture covered with leatherette in the physical shops was done based on information found on the product as well as information from the shop staff on the type of material.

The selection of the product from the internet shop was based on the information the shop had about the product.

When selecting furniture covered with leatherette from the physical shops it was in general considered which products the shop staff considered popular. The project economy dictated some consideration of the product price during the selection.

The following furniture covered with leatherette was purchased.

Table 2.3 Purchased products – Furniture covered with leatherette

No.	Type	Brief description	Shop type
2-41	Footstool	Matt black rectangular	Discount chain for furniture and textile
2-42	Footstool	Polished black rectangular	Furniture store
2-43	Dining table chair	Black chair with steel legs	Discount chain for furniture and textile
2-44	Easy chair	Black chair with steel frame	Furniture store
2-45	Dining table chair	Black chair with steel base	Discount chain for furniture and textile
2-46	Footstool	Green rectangular lacquered	Interior design shop
2-66	Dining table chair	Black chair with steel legs	Furniture store
2-67	Dining table chair	Black chair with wooden legs	Furniture store
2-68	Dining table chair	Black chair with steel base	Furniture store
2-69	Dining table chair	Black chair with steel legs	Furniture store
2-70	Dining table chair	Black chair with steel base	Furniture store
2-71	Dining table chair	White round chair with steel base	Furniture store
2-72	Barstool	Black with “tractor seat”	Furniture store
2-73	Dining table chair	Black with steel legs	Furniture store
2-79	Footstool	Red rectangular with animal motif	Internet shop

2.5.9 Product prices

During the survey furniture covered with leatherette were registered in a price range form 23.87 to 226.53 Note that focus was kept on this price range in order to consider the project economy.

2.6 Curtains

2.6.1 Delimitation

The product group curtain was limited to curtains for blackout and venetian blind made from PVC.

2.6.2 Procedure

The survey of black out curtains and venetian blinds made from PVC was carried out in April and May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were visited.

2.6.3 Shop visits

Visits were paid to a wide range of shops, including:

- Curtain shops
- interior design shops
- furniture stores
- carpet shops
- department stores
- Discount chains for furniture and textiles
- supermarkets.

In addition, catalogues, advertising brochures etc. were examined.

2.6.4 Internet visits

Internet shops have been visited. Key words in the search were “persienner, mørklægningsgardiner, vinyl, PVC” (Venetian blind, blackout curtains, vinyl, PVC).

2.6.5 Results of survey

The majority of the registered blackout curtains were made from 100% polyester. Some were made from a mixture of cotton and polyester and a few were made from 100% cotton. None of the registered black out curtains were made from vinyl/PVC or coated with vinyl/PVC.

Only two venetian blinds made from PVC were registered.

2.6.6 Results of shop visits

Only one venetian blind made from PVC was registered in the visited shops.

2.6.7 Results of survey via internet pages

Only one venetian blind made from PVC was registered in the visited internet shops.

As well as in the physical shops only blackout curtains made from polyester, cotton or mixtures of the two were registered in the internet shops.

2.6.8 Selected products

Table 2.4 shows the product that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

Table 2.4 purchased product – Venetian blind made from PVC

No.	Type	Brief description	Shop type
2-47	Vinyl venetian blind	White venetian blind	Discount chain for furniture and textile

2.6.9 Product prices

During the survey venetian blind made from PVC were registered at a price of 7.87 and 39.73.

2.7 Lampshades

As no blackout curtains and only a few venetian blinds made from PVC were registered, lampshades were included in the project.

A limited survey of lampshades has been conducted.

2.7.1 Delimitation

The product group lampshades was limited to lampshades made from plastic and/or where the inside is made from plastic.

2.7.2 Procedure

The limited survey of lampshades was carried out in May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

2.7.3 Shop visits

Visits were paid to a wide range of shops, including:

- lamp shops
- interior design shops
- furniture stores
- department stores
- discount chains for furniture and textiles
- supermarkets.

2.7.4 Results of survey

There is a large and varied supply of lampshades made from plastic or lampshades where the inside is made from plastic.

2.7.5 Selected products

Table 2.5 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

Table 2.5 Purchased products – Lampshades

No.	Type	Brief description	Shop type
2-48	Suspended lamp	Matt plastic lampshade with white pattern	DIY retailer
2-49	Lampshade for table and/or floor	Black cloth shade with pattern – inside of shade in plastic	DIY retailer

No.	Type	Brief description	Shop type
	lamp		
2-50	Suspended lamp	Red cloth shade with motifs – inside of shade made from plastic	DIY retailer
2-51	Suspended lamp	Doll with plastic shade as body	DIY retailer
2-52	Suspended lamp	Synthetic cloth shade with princesses	DIY retailer
2-53	Wall lamp	Yellow plastic shade with Vinnie the Pooh	DIY retailer
2-57	Table lamp	White plastic shade	Furniture store
2-58	Suspended lamp	Green cloth shade – inside made from plastic	Furniture store
2-59	Suspended lamp	Plastic shade with animal motif	Furniture store
2-81	Suspended lamp	Red cloth shade with teddy bears – inside of shade made from plastic	Furniture store

2.7.6 Product prices

Lamp shades were purchased in a price range from 20.00 to 59.87.

2.8 Shower curtains

2.8.1 Delimitation

The product group shower curtains was limited to shower curtains made from PVC/vinyl.

2.8.2 Procedure

The survey was carried out in April.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with shower curtains were visited.

2.8.3 Shop visits

Visits were paid to a wide range of shops, including:

- bath room paraphernalia shops
- DIY retailers
- department stores
- supermarkets
- interior design shops
- furniture stores
- discount chains for furniture and textiles
- retail chain for home textiles
- cloth shops
- hardware stores
- discount shops.

In addition, catalogues, advertising brochures etc. were examined.

2.8.4 Internet visits

Searching took place on Google with different search words and word combinations such as e.g."badeforhæng, badeforhæng and PVC/vinyl"

(shower curtain, shower curtain and PVC/vinyl) in order to find a number of internet shops that sell this group of products.

2.8.5 Results of survey

Shower curtains were registered in all of the physical shops visited, apart from discount shops. Shower curtains were to great extent registered at DIY retailers.

The majority of the observed shower curtains were made from polyester. Apart from PVC/vinyl some were made from PEVA and a few from cotton and micro fibres.

2.8.6 Results of shop visits

The supply of shower curtains made from PVC/vinyl was relatively large in the physical shops.

2.8.7 Results of survey via internet pages

In the visited internet shops there were, as well, registered a significant supply of shower curtains made from PVC/vinyl.

2.8.8 Selected products

Table 2.6 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

10 shower curtains made from PVC/vinyl were selected.

6 products were purchased from physical shops and 4 from internet shops.

Only shower curtains made from PVC/vinyl were selected.

Another criterion for the selection of products was a wish for inexpensive as well as more expensive products.

The following shower curtains were purchased.

Table 2.6 purchased products – shower curtains

No.	Type	Brief description	Shop type
2-1	Shower curtain	Transparent and purple	Department store
2-2	Shower curtain	Transparent with multi colour pattern	Internet shop
2-3	Shower curtain	Large	DIY retailer
2-4	Shower curtain	Transparent with blue pattern	DIY retailer
2-5	Shower curtain	White with red flowers	Hardware store
2-6	Shower curtain	Transparent	Department store
2-7	Shower curtain	Transparent with prism pattern	DIY retailer
2-8	Shower curtain	White with black pattern	Internet shop
2-9	Shower curtain	Blue with squares	Internet shop
2-10	Shower curtain	Transparent with red pattern	Internet shop

2.8.9 Product prices

During the survey shower curtains in a price range from 11.99 to 106.53 were registered.

2.9 Mattresses

2.9.1 Delimitation

The product group mattresses was limited to airbeds. The survey has focussed on airbeds used as “beds”, that is they have not been marketed water toys etc.

2.9.2 Procedure

The survey of airbeds was carried out in May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighbourhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with airbeds were visited.

2.9.3 Shop visits

Visits were paid to a wide range of shops, including:

- DIY retailers
- Sporting goods stores
- department stores
- supermarkets
- discount chains for furniture and textiles.

In addition, catalogues, advertising brochures etc. were examined.

2.9.4 Internet visits

Searching took place on Google with different search words and word combinations such as e.g.”luftmadrasser, gæstesenge and PVC/vinyl” (airbeds, guest bed and PVC/vinyl) in order to find a number of internet shops that sell this group of products.

2.9.5 Results of survey

Airbeds were registered in all of the visited physical shops and to great extent at DIY retailers.

2.9.6 Results of shop visits

Almost all of the visited shops dealt in airbeds, but largely the same types and brands of airbeds. In particular two brands were registered in many shops.

2.9.7 Results of survey via internet pages

A relatively large supply of airbeds was registered in the visited internet shops.

2.9.8 Selected products

Table 2.7 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

13 airbeds were selected. 11 products were purchased from physical shops and 2 from internet shops.

Table 2.7 Purchased products –airbeds

No.	Type	Brief description	Shop type
2-23	Airbed	Velour top	Discount chain for furniture and textile
2-24	Airbed	Channels and headrest	Discount chain for furniture and textile
2-25	Airbed	Velour top	DIY retailer
2-26	Airbed	Channels and headrest	DIY retailer
2-27	Airbed	Channels and headrest	DIY retailer
2-28	Airbed	velour top	Discount chain for furniture and textile
2-29	Airbed	Self inflatable sleeping matt	Discount chain for furniture and textile
2-30	Airbed	Velour top – thick model	DIY retailer
2-31	Airbed	Self inflatable	Supermarket
2-62	Airbed	channels	Internet shop
2-77	Airbed	Velour top	Sporting goods store
2-64	Airbed	Velour top	Internet shop
2-65	Airbed	Velour top	Internet shop

2.9.9 Product prices

During the survey, airbeds were registered in a price range from 10.66 to 53.33.

2.10 Tablecloths and dinner mats

2.10.1 Delimitation

Tablecloths were limited to oilcloth. Oilcloth is a very popular product in families with children – especially in families with small children.

During the survey of the product group, dinner mats were also included to a limited degree.

2.10.2 Procedure

The survey of oilcloth was carried out in April and the first part of May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighborhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with oilcloth were visited.

2.10.3 Shop visits

Visits were paid to a wide range of shops, including:

- Textile shops
- Department stores
- Supermarkets
- DIY retailers
- Interior design shops
- Furniture shops
- Discount shops with furniture and textiles
- Hardware stores
- Discount shops.

In addition, catalogues, advertising brochures etc. were examined.

2.10.4 Internet visits

Searching took place on Google with different search words such as e.g."voksdug, voksdug og PVC/vinyl" (oilcloth, oilcloth and PVC/vinyl) in order to find a number of internet shops that sell goods from this product group.

2.10.5 Results of survey

Oilcloth was registered in all of the visited physical shops except for discount shops where only dinner mats were registered.

2.10.6 Results of shop visits

The supply of oilcloth in the physical shops was very large. A number of different trademarks/brands were registered and so were many different types/materials.

Tablecloths were registered with descriptions such as acryl, acryl-coated, vinyl/PVC, phthalate free PVC, PVC-coated cotton, PVC-coated flax, plastic, EVA, PE.

As mentioned previously, dinner mats were only to a limited degree included in the survey. Dinner mats were registered in a large part of the physical shops. However, a substantial part of the registered dinner mats were of the same trademarks in the various shops. Only a few of the dinner mats that were registered were made of vinyl/PVC.

2.10.7 Results of survey via internet pages

A very large supply of oilcloth was registered in the internet shops.

In general, dinner mats were not searched for in internet shops. Dinner mats with motifs that appeal to children were searched for, but the registered dinner mats had no information about the material they were made of.

2.10.8 Selected products

Table 2.8 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.
A total of 9 oilcloths and 3 dinner mats were selected.

All 12 products were purchased in physical shops.

The selected oilcloth was mainly the oilcloth that according to the staff in the visited shops was purchased by families with children.

Another criterion for the selection of products was a wish for inexpensive as well as more expensive products.

The below oilcloth and dinner mats were purchased.

Table 2.8 Purchased products – Oilcloth and dinner mats

No.	Type	Brief description	Shop type
1-5	Oilcloth	Red oilcloth with white dots	Textile shop
1-6	Oilcloth	Transparent oilcloth with white dots	Textile shop
1-7	Oilcloth	Purple oilcloth with white flower	Textile shop
1-8	Oilcloth	Blue oilcloth with child's motif	DIY retailer
1-9	Oilcloth	Lime green oilcloth with white line pattern	Supermarket
1-10	Oilcloth	Striped (sand-coloured and white) oilcloth	Textile shop
1-11	Dinner mat	Orange weave patterned dinner mat	Hardware store
1-32	Oilcloth	Blue striped oilcloth	Discount shop with furniture and textiles
1-33	Oilcloth	Black oilcloth with flower motif	Discount shop with furniture and textiles
1-34	Oilcloth	White "lace" oilcloth	Supermarket
1-59	Dinner mat	Red and white striped dinner mat with motif	Discount shop
1-60	Dinner mat	Green dinner mat formed as a fruit	Discount shop

2.10.9 Product prices

During the survey, oilcloth was registered in the price range from 2.66 per metre to 39.33 per metre and dinner mats in the range from 1.33 each to 9.33 each.

2.11 Balance balls

2.11.1 Delimitation

In addition to balance balls, the survey to a limited degree also comprised small exercise balls.

2.11.2 Procedure

The survey of balance balls was carried out in April and the first part of May.

Visits were paid to a number of retail shops in the Danish city of Aarhus and in the neighborhood. Mainly nation-wide shops were in question but local shops were also visited.

In addition, a wide range of internet shops dealing with oilcloth were visited.

2.11.3 Shop visits

Visits were paid to a wide range of shops, including:

- Sports shops
- Department stores
- Supermarkets
- DIY retailers
- Discount shops with furniture and textiles
- Discount shops.

In addition, catalogues, advertising brochures etc. were examined.

2.11.4 Internet visits

Searching took place on Google with different search words such as e.g. "balance balls, balance balls and PVC/vinyl, training equipment, fitness,

exercise balls" in order to find internet shops that sell goods from this product group.

2.11.5 Results of survey

Balance balls were mainly registered in sports shops and department stores with a sports department.

2.11.6 Results of shop visits

Some trademarks recurred several times in most of the shops where balance balls were registered.

As mentioned above, balance balls were mainly registered in sports shops and department stores with a sports department.

2.11.7 Results of survey via internet pages

A very large supply of balance balls and small exercise balls were registered in the internet shops.

2.11.8 Selected products

Table 2.7 shows the products that in cooperation with the Danish Environmental Protection Agency were selected for analysis of content of the four classified phthalates DEHP, BBP, DBP and DIBP.

A total of 10 balance balls were selected.

A total of three products were purchased from physical shops and seven products were purchased in internet shops.

If the label or the description on the homepage of the individual internet shop informed that the balance ball or the gym ball was made of PVC, then the product was selected. However, in most cases there was no information about the material used.

Another criterion for the selection of products was a wish for inexpensive as well as more expensive products.

The following balance balls and other exercise balls were purchased:

Table 2.9 Purchased products – Balance balls and other exercise balls.

No.	Type	Brief description	Shop type
1-13	Balance ball	Balance ball – 55 cm in diameter. Silver-Metallic	Sports shop
1-14	Balance ball	Balance ball – 65 cm in diameter. Black	Sports shop
1-15	Balance ball	Balance ball – 70 cm in diameter. Blue	Sports shop
1-21	Balance ball	Massage ball with "rubber nubs" – app. 55 cm in diameter	Internet shop
1-22	Redondo ball	Gym ball - app. 22 cm in diameter. Blue	Internet shop
1-23	Mini ball	9 cm in diameter. Green	Internet shop
1-24	Training ball	Soft ball in foamed material – max. 25 cm in diameter	Internet shop
1-25	Redondo ball	Gym ball - app. 22 cm in diameter. Orange	Internet shop
1-26	Balance ball	Balance ball – 65 cm in diameter. Silver	Internet shop
1-27	Balance ball	Balance ball – 65 cm. Purple	Internet shop

2.11.9 Product prices

During the survey, balance balls and other exercise balls were registered in the price range from 7.50 to 46.67.

3 Chemical analyses

3.1 Objective of analyses

The chemical analyses illustrate to which extent a number of products contain one or more of the four selected phthalates: DIBP, DBP, BBP and DEHP.

The following product groups are in question:

- Floor covering
- Wall lining
- Furniture
- Curtains
- Lamp shades
- Mattresses
- Shower curtains
- Oil cloths and dinner mats
- Balance balls.

All the products selected for the survey were analysed quantitatively for the four phthalates DIBP, DBP, BBP or DEHP.

This project solely focuses on the content of DIBP, DBP, BBP and DEHP. Therefore, it cannot be ruled out that there might be a content of other phthalates in the analysed products.

3.1.1 Choice of extraction agent and sampling

The selected analysis method for determination of the phthalates DIBP, DBP, BBP and DEHP in the products was extraction with dichloromethane which is believed to be the most suitable solvent for liberating phthalates completely from the relevant polymer materials. PVC is for instance soluble in that solvent.

In connection with the quantitative analyses a sample amount was removed from each product. Some products consist of several types of material and in those cases a sample amount was selected containing those surfaces which could contain phthalates. Sampling is described in detail in the following chapters under each product group.

3.1.2 Method description of quantitative analyses

A weighed sample amount (app. 0.5-1g) was extracted with 10 ml dichloromethane (DCM) added deuterium marked internal standards (DBP-d_4 and DEHP-d_4) by ultrasound extraction. In connection with lightweight materials the sample amount can be smaller and a correspondingly smaller amount of extraction agent is used. Analysis in duplicate was carried out.

The extracts were analysed by means of gas chromatography with mass spectrometric detection (GC-MS). The concentration of phthalates was calculated quantitatively against standards of the respective phthalates DIBP, DBP, BBP and DEHP. Blank specimens and control tests were included in

the analysis. If the analysis showed larger concentrations of other phthalates, they are stated as comments to the quantitative analyses.

Table 3.1 states the complete name of the phthalates and the CAS-no. besides the internal standards.

Table 3.1 Outline of the applied reference standards and internal standards

Phthalate abbreviation	Name	CAS-no.	Application
DIBP	Diisobutyl phthalate	84-69-5	Reference standard
DBP	Dibutyl phthalate	84-74-2	Reference standard
BBP	Benzylbutyl phthalate	85-68-7	Reference standard
DEHP	Di(ethylhexyl) phthalate	117-81-7	Reference standard
DBP-d_4	Deuterium labelled Dibutyl phthalate		Internal standard
DEHP-d_4	Deuterium labelled Di(ethylhexyl) phthalate		Internal standard

Table 3.2 shows the chromatographic conditions.

Table 3.2 Parameters for GC-MS

GC/MS-instrument	Agilent GC-MS
GC-parameters	Column: Phenomex, ZB-5MS 30 m x 0.5 mm id., 0.25 µm film thickness Carrier gas: Helium, constant flow at 1.8 ml/min. Oven program: 40 ºC for 0.5 min., 30 ºC/min. to 250 ºC, 20 ºC/min. at 320 ºC, 320 ºC for 8 min. Injection: 2 µl, 280 ºC, splitless
MS-parameters	Scan mode: 40-450 m/z

The results are stated below and are organised according to the different product groups. They are stated as mg/kg and in %(m/m), respectively, which is the percentage by weight (mass/mass). Additionally the results are stated as g/m^2.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD).

Results below the detection limit are stated as "< L.O.D", Limit of Detection. The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001 %(m/m), that is the weight percentage (mass/mass).

The relative uncertainty of the method is estimated to 10-15%.

3.2 Analyses of floor covering

3.2.1 Quantitative analyses of floor covering

Floor covering consist of vinyl based/vinyl coated floor coverings and carpets with rubber back. From vinyl floor covering sold by the meter, vinyl tiles and carpet with rubber back samples have been taken from the entire product. On the back of the vinyl tile there was glue. The products were cut into smaller pieces prior to analysis.

A part of the vinyl covered wood panels were grounded into sawdust, from which a sample was taken to analysis.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.3 are used in calculation of the concentration of phthalates per product area (g/m^2).

The quantitative analysis results appear from Table 3.4, Table 3.5 and Table 3.6.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (RSD).

Results below the detection limit are stated as "< L.O.D".
The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.3 Determination of weight per area, floor covering

Product no.	Type	Weight of product per area g/m^2
2-55	Vinyl panels	6987
2-56	Vinyl panels	6187
2-32	Carpet with rubber back	1385
2-33	Vinyl covering sold by the meter	1157
2-34	Carpet with rubber back	559
2-35	Vinyl covering sold by the meter	1770
2-36	Carpet with rubber back	3360
2-37	Carpet with rubber back	2980
2-38	Vinyl covering sold by the meter	1980
2-39	Vinyl covering sold by the meter	1700
2-40	Carpet tile with glue	1813
2-54	Carpet with rubber back	2101
2-61	Carpet with rubber back	1269
2-60	Carpet with rubber back	3425
2-78	Vinyl tile	3927
2-80	Vinyl panels	9598

Table 3.4 Results of quantitative analyses in mg/kg, floor covering

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-55	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-56	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-32	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-33	Vinyl covering sold by the meter	814	811	813	2	< L.O.D	< L.O.D	< L.O.D		114	112	113	1	317	333	325	12
2-34	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-35	Vinyl covering sold by the meter	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-36	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-37	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-38	Vinyl covering sold by the meter	68	45	56	16	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-39	Vinyl covering sold by the meter	71200	76100	73650	3470	128	130	129	2	< L.O.D	< L.O.D	< L.O.D		< L.O.D**	< L.O.D**	< L.O.D**	
2-40	Carpet tile with glue	164	149	156	11	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-54	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-61	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-60	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-78	Vinyl tile	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		46	51	49	3
2-80	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

’ Detection limit (L.O.D) raised to <50

** Detection limit (L.O.D) raised to <1000 due to interference from diethylphthalate or other similar phthalate

Table 3.5 Results of quantitative analyses in %(m/m), floor covering

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
2-55	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-56	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-32	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-33	Vinyl covering sold by the meter	0.081	0.081	0.081	0.0002	< L.O.D	< L.O.D	< L.O.D		0.011	0.011	0.011	0.0001	0.032	0.033	0.032	0.001
2-34	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-35	Vinyl covering sold by the meter	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-36	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-37	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< 0.005	< 0.005	< 0.005	
2-38	Vinyl covering sold by the meter	0.007	0.005	0.006	0.0016	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-39	Vinyl covering sold by the meter	7.1	7.6	7.4	0.3	0.013	0.013	0.013	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D**	< L.O.D**	< L.O.D**	
2-40	Carpet tile with glue	0.016	0.015	0.016	0.001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-54	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-61	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-60	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-78	Vinyl tile	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.005	0.005	0.005	0.0003
2-80	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

' Detection limit (L.O.D) raised to <0.005

** Detection limit (L.O.D) raised to <0.1 due to interference from diethylphthalate or other similar phthalate

Table 3.6 Results of quantitative analyses in g/m², Floor covering

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²
2-55	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-56	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-32	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-33	Vinyl covering sold by the meter	0.94	0.94	0.94	0.002	< L.O.D	< L.O.D	< L.O.D		0.13	0.13	0.13	0.002	0.37	0.39	0.38	0.01
2-34	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-35	Vinyl covering sold by the meter	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-36	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-37	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< 0.05	< 0.05	< 0.05	
2-38	Vinyl covering sold by the meter	0.13	0.09	0.11	0.03	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-39	Vinyl covering sold by the meter	121	129	125	6	0.22	0.22	0.22	0.003	< L.O.D	< L.O.D	< L.O.D		< L.O.D**	< L.O.D**	< L.O.D**	
2-40	Carpet tile with glue	0.30	0.27	0.28	0.02	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-54	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-61	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-60	Carpet with rubber back	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-78	Vinyl tile	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.18	0.20	0.19	0.01
2-80	Vinyl panels	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

’ Detection limit (L.O.D) raised to <0.05

** Detection limit (L.O.D) raised to <1 due to interference from diethylphthalate or other similar phthalate

3.2.2 Comments to quantitative analyses of floor covering

Phthalates were detected in 5 of the floor coverings. In one product only 1 of the four selected phthalates (DIBP) was found in more than 1% (m/m).

Other phthalates were detected in several of the floor coverings and they are stated in Table 3.7. It has not been investigated in this project whether the products contained other phthalates.

Table 3.7 Outline of other phthalates detected in bags

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononyl phthalate	28553-12-0	2-33, 2-35, 2-38, 2-39, 2-78, 2-80

3.3 Analyses of wall lining

3.3.1 Quantitative analyses of wall lining

Wall lining consists of vinyl wallpaper. A sample was taken across the wallpaper pattern and cut into smaller pieces prior to analysis.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.8 are used in calculation of the concentration of phthalates per product area (g/m^2).

Quantitative analysis results appear from Table 3.9 and Table 3.10.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD).

Results below the detection limit are stated as "< L.O.D".
The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.8 Determination of weight per area, wall lining

Product no.	Type	Weight of product per area g/m^2
2-11	Vinyl wallpaper	167
2-12	Vinyl wallpaper	190
2-13	Vinyl wallpaper	212
2-14	Vinyl wallpaper	174
2-15	Vinyl wallpaper	227
2-16	Vinyl wallpaper	245
2-17	Vinyl wallpaper	269
2-18	Vinyl wallpaper	242
2-19	Vinyl wallpaper	138
2-20	Vinyl wallpaper	181
2-21	Vinyl wallpaper	240
2-22	Vinyl wallpaper	290
2-74	Vinyl wallpaper	172
2-75	Vinyl wallpaper	232
2-76	Vinyl wallpaper	290

Table 3.9 Results of quantitative analyses in mg/kg, wall lining

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average. (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-11	Vinyl wallpaper	11	12	12	1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-12	Vinyl wallpaper	665	587	626	55	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-13	Vinyl wallpaper	36	40	38	3	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-14	Vinyl wallpaper	6	5	5	0,1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-15	Vinyl wallpaper	47	44	46	2	31	30	30	1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-16	Vinyl wallpaper	19	21	20	2	11	12	12	1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-17	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		10	9	10	1
2-18	Vinyl wallpaper	< L.O.D	13	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		10	18	14	5
2-19	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-20	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-21	Vinyl wallpaper	16	14	15	1	10	8	9	2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-22	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-74	Vinyl wallpaper	20	17	19	2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		17	30	24	9
2-75	Vinyl wallpaper	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-76	Vinyl wallpaper	7	9	8	2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

*Detection limit (L.O.D) raised to < 100

Table 3.10 Results of quantitative analyses in %(m/m), wall lining

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
2-11	Vinyl wallpaper	0.001	0.001	0.001	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-12	Vinyl wallpaper	0.067	0.059	0.063	0.006	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-13	Vinyl wallpaper	0.004	0.004	0.004	0.0003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-14	Vinyl wallpaper	0.001	0.001	0.001	0.00001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-15	Vinyl wallpaper	0.005	0.004	0.005	0.0002	0.003	0.003	0.003	0.00008	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-16	Vinyl wallpaper	0.002	0.002	0.002	0.0002	0.001	0.001	0.001	0.00006	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-17	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.001	0.001	0.001	0.00007
2-18	Vinyl wallpaper	< L.O.D	0.001	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.001	0.002	0.001	0.0005
2-19	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-20	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-21	Vinyl wallpaper	0.002	0.001	0.001	0.0001	0.001	0.001	0.001	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-22	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-74	Vinyl wallpaper	0.002	0.002	0.002	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.002	0.003	0.002	0.0009
2-75	Vinyl wallpaper	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-76	Vinyl wallpaper	0.001	0.001	0.001	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

*Detection limit (L.O.D) raised to < 0.01

Table 3.11 Results of quantitative analyses in g/m², wall lining

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²
2-11	Vinyl wallpaper	0.002	0.002	0.002	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-12	Vinyl wallpaper	0.13	0.11	0.12	0.01	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-13	Vinyl wallpaper	0.008	0.009	0.008	0.001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-14	Vinyl wallpaper	0.001	0.001	0.001	0.00002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-15	Vinyl wallpaper	0.01	0.01	0.01	0.0004	0.007	0.007	0.007	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-16	Vinyl wallpaper	0.005	0.005	0.005	0.0005	0.003	0.003	0.003	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-17	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.003	0.002	0.003	0.0002
2-18	Vinyl wallpaper	< L.O.D	0.003	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.003	0.004	0.003	0.001
2-19	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-20	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-21	Vinyl wallpaper	0.004	0.003	0.004	0.0003	0.003	0.002	0.002	0.0004	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-22	Vinyl wallpaper	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-74	Vinyl wallpaper	0.004	0.003	0.003	0.0004	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.003	0.005	0.004	0.002
2-75	Vinyl wallpaper	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-76	Vinyl wallpaper	0.002	0.003	0.002	0.0005	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

*Detection limit (L.O.D) raised to < 0.02

3.3.2 Comments to quantitative analyses of wall lining

Low concentrations of DIBP, DBP or DEHP were detected in all products except no. 2-19, 2-20, 2-22 and 2-75.

BBP was not detected in any of the products.

As shown in Table 3.12 another phthalate was detected in several wall linings.

Table 3.12 Other phthalates detected in wall lining.

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononylftalat	28553-12-0	2-11, 2-12, 2-13, 2-15,2-1 6,2-1 8, 2-21, 2-22, 2-75, 2-76

3.4 Analyses of furniture

3.4.1 Quantitative analyses of furniture

Furniture covered with leatherette consists of poufs, dining table chairs, easy chairs and barstools. Samples were taken from the leatherette and cut into smaller pieces prior to analysis.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.13 are used in calculation of the concentration of phthalates per product area (g/m^2). Additionally the total area covered with leatherette was estimated.

The quantitative analysis results appear from Table 3.14, Table 3.15 and Table 3.16.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD).

Results below the detection limit are stated as "< L.O.D".
The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.13 Determination of weight per area, furniture

Product no.	Type	Weight of product per area g/m^2	Total area covered with leatherette m^2
2-41	Footstool	392	0.79
2-42	Footstool	387	0.92
2-43	Dining table chair	437	0.60
2-44	Easy chair	859	1.97
2-45	Dining table chair	459	0.78
2-46	Footstool	409	0.54
2-66	Dining table chair	467	0.92
2-67	Dining table chair	485	0.93
2-68	Dining table chair	528	0.81
2-69	Dining table chair	336	0.76
2-70	Dining table chair	469	0.90
2-71	Dining table chair	489	1.08
2-72	Barstool	815	0.35
2-73	Dining table chair	378	0.70
2-79	Footstool	609	0.54

Table 3.14 Results of quantitative analyses in mg/kg, furniture

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average. (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-41	footstool	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		210	207	208	2
2-42	footstool	8	8	8	0.1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-43	dining table chair	214	218	216	3	338	343	340	4	597	706	652	77	71200	73300	72250	1485
2-44	easy chair	384	392	388	6	8	8	8	0.2	< 50	< 50	< 50		219000	215000	217000	2828
2-45	dining table chair	41	41	41	0.1	11	11	11	0.2	< L.O.D	< L.O.D	< L.O.D		223000	560000	391500	238295
2-46	footstool	< L.O.D	< L.O.D	< L.O.D		2	3	2	0.5	< L.O.D	< L.O.D	< L.O.D		16	33	24	12
2-66	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		149000	139000	144000	7071
2-67	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-68	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		96500	100000	98250	2475
2-69	dining table chair	36	41	39	4	22	22	22	0.1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-70	dining table chair	1160	1120	1140	28	187	179	183	6	< L.O.D*	< L.O.D*	< L.O.D*		154000	211000	182500	40305
2-71	dining table chair	13	22	18	6	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		119000	120000	119500	707
2-72	barstool	15900	16600	16250	495	335	335	335	0.2	114	135	124	14	142000	150000	146000	5657
2-73	dining table chair	16	12	14	3	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		102000	104000	103000	1414
2-79	footstool	36	40	38	2	11	11	11	0.1	< L.O.D	< L.O.D	< L.O.D		35	34	35	1

*Detection limit (L.O.D) raised to < 50

Table 3.15 Results of quantitative analyses in %(m/m), furniture

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
2-41	footstool	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.021	0.021	0.021	0.0002
2-42	footstool	0.001	0.001	0.001	0.00001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-43	dining table chair	0.021	0.022	0.022	0.0003	0.034	0.034	0.034	0.0004	0.06	0.07	0.07	0.01	7.1	7.3	7.2	0.1
2-44	easy chair	0.038	0.039	0.039	0.0006	0.001	0.001	0.001	0.00002	<0.005	<0.005	<0.005		21.9	21.5	21.7	0.3
2-45	dining table chair	0.004	0.004	0.004	0.00001	0.001	0.001	0.001	0.00002	< L.O.D	< L.O.D	< L.O.D		22.3	56.0	39.2	23.8
2-46	footstool	< L.O.D	< L.O.D	< L.O.D		0.0002	0.0003	0.0002	0.00005	< L.O.D	< L.O.D	< L.O.D		0.002	0.003	0.002	0.001
2-66	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		14.9	13.9	14.4	0.7
2-67	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-68	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		9.7	10.0	9.8	0.2
2-69	dining table chair	0.004	0.004	0.004	0.0004	0.002	0.002	0.002	0.00001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-70	dining table chair	0.12	0.11	0.11	0.003	0.019	0.018	0.018	0.00056	< L.O.D*	< L.O.D*	< L.O.D*		15.4	21.1	18.3	4.0
2-71	dining table chair	0.001	0.002	0.002	0.0006	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		11.9	12.0	12.0	0.1
2-72	barstool	1.6	1.7	1.6	0.05	0.033	0.033	0.033	0.00002	0.011	0.013	0.012	0.001	14.2	15.0	14.6	0.6
2-73	dining table chair	0.002	0.001	0.001	0.0003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		10.2	10.4	10.3	0.1
2-79	footstool	0.004	0.004	0.004	0.0002	0.001	0.001	0.001	0.00001	< L.O.D	< L.O.D	< L.O.D		0.003	0.003	0.003	0.00005

*Detection limit (L.O.D) raised to < 0.005

Table 3.16 Results of quantitative analyses in g/m², furniture

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²
2-41	footstool	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.08	0.08	0.08	0.001
2-42	footstool	0.003	0.003	0.003	0.0000	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-43	dining table chair	0.094	0.095	0.095	0.001	0.15	0.15	0.15	0.002	0.26	0.31	0.28	0.03	31	32	32	1
2-44	easy chair	0.330	0.336	0.333	0.005	0.007	0.007	0.007	0.0001	<0.05	<0.05	<0.05		188	185	186	2
2-45	dining table chair	0.019	0.019	0.019	0.00003	0.005	0.005	0.005	0.0001	< L.O.D	< L.O.D	< L.O.D		102	257	180	109
2-46	footstool	< L.O.D	< L.O.D	< L.O.D		0.001	0.001	0.001	0.0002	< L.O.D	< L.O.D	< L.O.D		0.006	0.014	0.010	0.005
2-66	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		70	65	67	3
2-67	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-68	dining table chair	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		51	53	52	1
2-69	dining table chair	0.012	0.014	0.013	0.001	0.008	0.008	0.008	0.00003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-70	dining table chair	0.54	0.53	0.54	0.01	0.088	0.084	0.086	0.003	< L.O.D*	< L.O.D*	< L.O.D*		72	99	86	19
2-71	dining table chair	0.007	0.011	0.009	0.003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		58	59	58	0.3
2-72	barstool	13.0	13.5	13.2	0.4	0.27	0.27	0.27	0.0002	0.09	0.11	0.10	0.01	116	122	119	5
2-73	dining table chair	0.006	0.004	0.005	0.001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		39	39	39	1
2-79	footstool	0.022	0.024	0.023	0.002	0.007	0.006	0.007	0.0001	< L.O.D	< L.O.D	< L.O.D		0.02	0.02	0.02	0.0003

*Detection limit (L.O.D) raised to < 0.005

3.4.2 Comments to quantitative analyses of furniture

DIBP, DBP, DBB and DEHP were all detected in the different furniture.

In total nine of the furniture pieces more than 1% (m/m) DEHP was present. The highest amount of DEHP (39% (m/m)) was found in a dinning chair. In one piece of furniture was found more than1 % of DIBP.

As shown Table 3.17 another phthalate was detected in some of the furniture. It has not been investigated in this project whether the products contained other phthalates.

Table 3.17 Outline of other phthalates in furniture

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononyl phthalate	28553-12-0	2-43, 2-70, 2-73

3.5 Analyses of curtains

3.5.1 Quantitative analyses of curtains

From the venetian blinds a sample was taken from a lamella and cut into smaller pieces prior to analysis.

The product weight per area was determined by weighing a lamella (12.7g) and measuring (80x2.5 cm^2). Furthermore the number of lamella was counted (58) in order to estimate the total surface area. Result is shown in Table 3.18 are used in calculation of the concentration of phthalates per product area (g/m^2).

No DIBP, DBP, DBB or DEHP was detected in the analysis. It has not been investigated in this project whether the product contained other phthalates.

The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.18 Determination of weight per area, curtains

Product no.	Type	Weight of product per area g/m^2	Total area of product m^2
2-47	Vinyl venetian blind	635	1.16

3.6 Analyses of lamp shades

3.6.1 Quantitative analyses of lamp shades

Several of the selected lamp shades consist of several different colours and patterns. One analysis was carried out per product. During sampling, importance was placed on removing the sample amount across colours and patterns.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.19 are used in calculation of the concentration of phthalates per product area (g/m^2).

The quantitative analysis results appear from Table 3.20, Table 3.21 and Table 3.22.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD).

Results below the detection limit are stated as"< L.O.D.".
The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001 %(m/m).

Table 3.19 Determination of weight per area, lamp shades

Product no.	Type	Weight of product per area g/m^2	Surface area of lamp shade m^2
2-48	Suspended lamp	359	0.62
2-49	Lampshade for table and/or floor lamp	492	0.10
2-50	Suspended lamp	601	0.19
2-51	Suspended lamp	578	0.09
2-52	Suspended lamp	94	0.14
2-53	Wall lamp	536	0.16
2-57	Table lamp	1232	0.36
2-58	Suspended lamp	457	0.25
2-59	Suspended lamp	279	0.17
2-81	Suspended lamp	576	0.15

Table 3.20 Results of quantitative analyses in mg/kg, lamp shades

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-48	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-49	Lampshade for table and/or floor lamp	9.2	8.9	9.0	0.2	14	14	14	0.1	< L.O.D	< L.O.D	< L.O.D		14	14	14	0.1
2-50	Suspended lamp	322	353	337	21	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		19	25	22	4
2-51	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-52	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-53	Wall lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		16	10	13	4
2-57	Table lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-58	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		752	686	719	47	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-59	Suspended lamp	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D	< L.O.D
2-81	Suspended lamp	23	24	24	0	36	38	37	1	< L.O.D	< L.O.D	< L.O.D		378	353	365	17

Table 3.21 Results of quantitative analyses in %(m/m), lamp shades

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average. %	SD %
2-48	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-49	Lampshade for table and/or floor lamp	0.001	0.001	0.001	0.00002	0.001	0.001	0.001	0.00001	< L.O.D	< L.O.D	< L.O.D		0.001	0.001	0.001	0.00001
2-50	Suspended lamp	0.032	0.035	0.034	0.0021	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.002	0.002	0.002	0.0004
2-51	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-52	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-53	Wall lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.002	0.001	0.001	0.0004
2-57	Table lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-58	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		0.075	0.069	0.072	0.005	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-59	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-81	Suspended lamp	0.002	0.002	0.002	0.00003	0.004	0.004	0.004	0.00012	< L.O.D	< L.O.D	< L.O.D		0.038	0.035	0.037	0.002

Table 3.22 Results of quantitative analyses in g/m², lamp shades

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²
2-48	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-49	Lampshade for table and/or floor lamp	0.005	0.004	0.004	0.0001	0.007	0.007	0.007	0.00004	< L.O.D	< L.O.D	< L.O.D		0.007	0.007	0.007	0.0001
2-50	Suspended lamp	0.19	0.21	0.20	0.01	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.01	0.01	0.01	0.003
2-51	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-52	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-53	Wall lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.009	0.005	0.007	0.002
2-57	Table lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-58	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		0.34	0.31	0.33	0.02	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-59	Suspended lamp	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-81	Suspended lamp	0.013	0.014	0.014	0.0002	0.021	0.022	0.021	0.001	< L.O.D	< L.O.D	< L.O.D		0.22	0.20	0.21	0.01

3.6.2 Comments to quantitative analyses of lamp shades

DIBP, DBP and DEHP were detected in 5 lamp shades. The concentrations are very low (0.004-0.21% (m/m)).

BBP were not detected in any of the products in excess of the stated detection limit of 0.001%.

It has not been investigated in this project whether the products contained other phthalates.

3.7 Analyses of shower curtains

3.7.1 Quantitative analyses of shower curtains

Several of the selected shower curtains consist of various colours and patterns. One analysis was carried out per product. During sampling, importance was placed on removing the sample amount across colours and patterns.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.23 are used in calculation of the concentration of phthalates per product area (g/m^2).

The quantitative analysis results appear from Table 3.24, Table 3.25 and Table 3.26.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD).

Results below the detection limit are stated as "< L.O.D".
The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.23 Determination of weight per area, shower curtains

Product no.	Type	Weight of product per area g/m^2
2-1	shower curtain	248
2-2	shower curtain	103
2-3	shower curtain	130
2-4	shower curtain	129
2-5	shower curtain	147
2-6	shower curtain	150
2-7	shower curtain	176
2-8	shower curtain	199
2-9	shower curtain	166
2-10	shower curtain	119

Table 3.24 Results of quantitative analyses in mg/kg, shower curtains

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-1	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		249000	228000	238500	14800
2-2	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-3	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		11300	11200	11250	71
2-4	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		24100	18000	21050	4310
2-5	shower curtain	64.4	63.9	64.2	0.4	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		251000	300000	275500	34600
2-6	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-7	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		197	149	173	34
2-8	shower curtain	91.6	92.2	91.9	0.4	63.2	63.3	63.3	0.01	< L.O.D	< L.O.D	< L.O.D		282000	281000	281500	707
2-9	shower curtain	174	173	173	0.4	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		217000	244000	230500	19100
2-10	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		249	744	496	350

Table 3.25 Results of quantitative analyses in %(m/m), shower curtains

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
2-1	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		24.9	22.8	23.9	1.5
2-2	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-3	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		1.13	1.12	1.13	0.01
2-4	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		2.41	1.80	2.11	0.43
2-5	shower curtain	0.006	0.006	0.006	0.00004	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		25.1	30.0	27.6	3.5
2-6	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-7	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.020	0.015	0.017	0.00336
2-8	shower curtain	0.009	0.009	0.009	0.00004	0.006	0.006	0.006	0.000001	< L.O.D	< L.O.D	< L.O.D		28.2	28.1	28.2	0.1
2-9	shower curtain	0.017	0.017	0.017	0.00004	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		21.7	24.4	23.1	1.9
2-10	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.025	0.074	0.050	0.035

Table 3.26 Results of quantitative analyses in g/m², shower curtains

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²	a g/m²	b g/m²	Average g/m²	SD g/m²
2-1	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		61.8	56.5	59.1	3.7
2-2	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-3	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		1.5	1.5	1.5	0.01
2-4	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		3.1	2.3	2.7	0.6
2-5	shower curtain	0.009	0.009	0.009	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		36.9	44.1	40.5	5.1
2-6	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-7	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.035	0.026	0.030	0.006
2-8	shower curtain	0.018	0.018	0.018	0.0001	0.013	0.013	0.013	0.000003	< L.O.D	< L.O.D	< L.O.D		56.1	55.9	56.0	0.1
2-9	shower curtain	0.029	0.029	0.029	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		36.0	40.5	38.3	3.2
2-10	shower curtain	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.030	0.089	0.059	0.042

3.7.2 Comments to quantitative analyses of shower curtains

DIBP, DBP and DEHP were detected in 8 shower curtains.

In four of the shower curtains the content of DEHP was higher than 23% (m/m).

BBP were not detected in any of the products in excess of the stated detection limit of 0.001%.

It has not been investigated in this project whether the products contained other phthalates.

3.8 Analyses of mattresses

3.8.1 Quantitative analyses of mattresses

Several of the selected air beds had different top and bottom material. Samples were taken containing the same area from top and bottom. The samples were cut into smaller pieces prior to analysis.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.27 are used in calculation of the concentration of phthalates per product area (g/m^2).

Measurements on the surface area were done of the top surface area (where you would lie on the mattress). This measurement was less than stated on the airbeds packaging. This is a result of the fact that the material expands when air is pumped into the airbed.

The quantitative analysis results appear from Table 3.28, Table 3.29 and Table 3.30.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD). Results below the detection limit are stated as "< L.O.D". The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.27 Determination of weight per area, mattresses

Product no.	Type	Measurements stated on packaging cmxcmxcm	Measurement of top surface area cmxcm	Weight of product per area g/m^2
2-23	Air bed	195x73x16	180x68	398
2-24	Air bed	184x67x17	187x72	385
2-25	Air bed	188x62x5	180x68	396
2-26	Air bed	196x72	189x71,5	506
2-27	Air bed	200x130	197x125	523
2-28	Air bed	76x191x22	175x73	476
2-29	Air bed	180x51x15	174x52	264
2-30	Air bed	203x157x56	190x143	485
2-31	Air bed	163x208x47	180x143	721
2-62	Air bed	185x45	181x69	290
2-77	Air bed		192x73,5	472
2-64	Air bed	163x208x47	147x192	394
2-65	Air bed	183x76x13	180x76	423

Table 3.28 Results of quantitative analyses in mg/kg, mattresses

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
2-23	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		25.9	25.1	25.5	0.5
2-24	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		22	40	31	13
2-25	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-26	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-27	Air bed	10.8	11.3	11.0	0.3	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		139	138	138	0.3
2-28	Air bed	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		74	124	99	35
2-29	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		212738	262327	237533	35065
2-30	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		219	218	219	1
2-31	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-62	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		312000	296000	304000	11300
2-77	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		1530	1410	1470	85
2-64	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		86400	77300	81900	6440
2-65	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		187000	197000	192000	7070

*Detection limit (L.O.D) raised to <50

Table 3.29 Results of quantitative analyses in %(m/m), mattresses

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
2-23	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.003	0.003	0.003	0.00005
2-24	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.002	0.004	0.003	0.001
2-25	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-26	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-27	Air bed	0.001	0.001	0.001	0.00003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.014	0.014	0.014	0.00003
2-28	Air bed	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		0.007	0.012	0.010	0.004
2-29	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		21.3	26.2	23.8	3.5
2-30	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.022	0.022	0.022	0.0001
2-31	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-62	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		31.2	29.6	30.4	1.1
2-77	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.15	0.14	0.15	0.01
2-64	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		8.6	7.7	8.2	0.6
2-65	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		18.7	19.7	19.2	0.7

*Detection limit (L.O.D) raised to <0.005

Table 3.30 Results of quantitative analyses in g/m^2, mattresses

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2
2-23	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.01	0.01	0.01	0.0002
2-24	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.01	0.02	0.01	0.01
2-25	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
2-26	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-27	Air bed	0.006	0.006	0.006	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.07	0.07	0.07	0.0002
2-28	Air bed	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		0.04	0.06	0.05	0.02
2-29	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		56.1	69.2	62.6	9.2
2-30	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.11	0.11	0.11	0.0005
2-31	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
2-62	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		90.5	85.9	88.2	3.3
2-77	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.65	0.60	0.62	0.04
2-64	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		40.8	36.5	38.7	3.0
2-65	Air bed	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		73.8	77.7	75.7	2.8

*Detection limit (L.O.D) raised to <0.05

3.8.2 Comments to quantitative analyses of mattresses

The phthalate DEHP was detected in 11 of the 13 airbeds.

In four of the airbeds the amount of DEHP was higher than 8% (m/m).

DBP and BBP were not detected in any of the airbeds in excess of the stated detection limit of 0.001%. DIBP was detected in one airbed in low concentration.

As shown Table 3.31 another phthalate was detected in several of the airbeds. It has not been investigated in this project whether the products contained other phthalates.

Table 3.31 Outline of other phthalates in airbeds

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononyl phthalate	28553-12-0	2-23, 2-24, 2-25, 2-28, 2-30, 2-31, 2-64, 2-65

3.9 Analyses of oilcloth and dinner mats

3.9.1 Quantitative analyses of oilcloth and dinner mats

Several of the selected oilcloth and dinner mats consist of several different colours and patterns. One analysis was carried out per product. During sampling, importance was placed on removing the sample amount across colours and patterns.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.32 are used in calculation of the concentration of phthalates per product area (g/m^2).

The quantitative analysis results appear from Table 3.33, Table 3.34 and Table 3.35.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD). Results below the detection limit are stated as "< L.O.D". The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.32 Determination of weight per area, oilcloth and dinner mats

Product no.	Type	Weight of product per area g/m^2
1-5	Oilcloth	220
1-6	Oilcloth	193
1-7	Oilcloth	335
1-8	Oilcloth	377
1-9	Oilcloth	365
1-10	Oilcloth	323
1-11	Dinner mat	930
1-32	Oilcloth	342
1-33	Oilcloth	349
1-34	Oilcloth	396
1-59	Dinner mat	165
1-60	Dinner mat	346

Table 3.33 Results of quantitative analyses in mg/kg, oilcloth and dinner mats

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
1-5	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		195000	253000	224000	41000
1-6	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		256000	251000	254000	3540
1-7	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		200	191	196	6
1-8	Oilcloth	56.3	56.1	56.2	0.1	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		124000	136000	130000	8490
1-9	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		44.6	18.0	31.3	18.8
1-10	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		80.0	72.3	76.2	5.4
1-11	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-32	Oilcloth	8.3	9.4	8.9	0.8	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-33	Oilcloth	9.6	9.3	9.5	0.2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-34	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		226000	218000	222000	5660
1-59	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		4.1	7.4	5.7	2.3
1-60	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

Table 3.34 Results of quantitative analyses in %(m/m), oilcloth and dinner mats

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average. %	SD %
1-5	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		19.5	25.3	22.4	4.0
1-6	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		25.6	25.1	25.3	0.4
1-7	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.020	0.019	0.020	0.0006
1-8	Oilcloth	0.006	0.006	0.006	0.00001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		12.4	13.6	13.0	0.8
1-9	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.004	0.002	0.003	0.002
1-10	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.008	0.007	0.008	0.0005
1-11	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-32	Oilcloth	0.001	0.001	0.001	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-33	Oilcloth	0.001	0.001	0.001	0.00002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-34	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		22.6	21.8	22.2	0.6
1-59	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.0004	0.001	0.001	0.0002
1-60	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

Table 3.35 Results of quantitative analyses in g/m^2, oilcloth and dinner mats

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2
1-5	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		43.0	55.6	49.3	8.9
1-6	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		49.5	48.4	48.9	0.8
1-7	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.067	0.064	0.065	0.002
1-8	Oilcloth	0.021	0.021	0.021	0.00005	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		46.9	51.3	49.1	3.1
1-9	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.016	0.007	0.011	0.007
1-10	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.026	0.023	0.025	0.002
1-11	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-32	Oilcloth	0.003	0.003	0.003	0.0003	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-33	Oilcloth	0.003	0.003	0.003	0.0001	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	
1-34	Oilcloth	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		89.5	86.2	87.9	2.3
1-59	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.001	0.001	0.001	0.0004
1-60	Dinner mat	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D	

3.9.2 Comments to quantitative analyses of oilcloth and dinner mats

A high content of DEHP was detected in 4 oilcloths (no. 1-5, 1-6, 1-8 and 1-34) in concentrations of 22%, 25%, 13% equivalent to 22%.

In five oilcloths and one dinner mat DIBP or DEHP was detected in smaller concentrations, less than 0.02%.

DBP and BBP were not detected in any of the products in excess of the stated detection limit of 0.001%.

DINP was detected in several oilcloths as stated in Table 3.36. It has not been investigated in this project whether the products contained other phthalates.

Table 3.36 Outline of other phthalates detected in oilcloth and dinner mats

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononyl phthalate	28553-12-0	1-8, 1-9, 1-10, 1-34

3.10 Analyses of balance balls

3.10.1 Quantitative analyses of balance balls

Balance balls mainly consist of one material besides a valve. One analysis was carried out per product. During sampling, importance was placed on removing the sample amount from the material that forms the main part of the product.

The product weight per area was determined by weighing a 10x10 cm^2 sample. Results are shown in Table 3.37 are used in calculation of the concentration of phthalates per product area (g/m^2).

The quantitative analysis results appear from Table 3.38, Table 3.39 and Table 3.40.

The results are stated as single analyses (a and b), the average of the analyses in duplicate (average) and the calculated standard deviation of the analysis in duplicate (SD). Results below the detection limit are stated as "< L.O.D". The detection limits are 5-10 mg/kg equivalent to 0.0005-0.001%(m/m).

Table 3.37 Determination of weight per area, balance balls

Product no.	Type	Diameter cm	Total surface m^2	Weight of product per area g/m^2
1-13	Balance ball	55	0.95	1173
1-14	Balance ball	65	1.33	1352
1-15	Balance ball	70	1.54	1262
1-21	Balance ball	55	0.95	1492
1-22	Redondo ball	22	0.15	1273
1-23	Mini ball	9	0.025	4144
1-24	Training ball	25	0.20	693
1-25	Redondo ball	22	0.15	924
1-26	Balance ball	65	1.33	1222
1-27	Balance ball	65	1.33	1923

Table 3.38 Results of quantitative analyses in mg/kg, balance balls

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)	a (mg/kg)	b (mg/kg)	Average (mg/kg)	SD (mg/kg)
1-13	Balance ball	116	115	115	1	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*	
1-14	Balance ball	711	674	693	26	29.1	12.0	20.5	12.1	< L.O.D*	< L.O.D*	< L.O.D*		426000	458000	44200	22600
1-15	Balance ball	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*	
1-21	Balance ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		8690	9020	8860	233
1-22	Redondo ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
1-23	Mini ball	108000	110000	109000	1410	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		372	370	371	1
1-24	Training ball	365000	342000	355000	16300	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		4.4	13.9	9.2	6.7
1-25	Redondo ball	9.3	9.0	9.1	0.2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		122	130	126	5
1-26	Balance ball	303	295	299	6	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		466000	412000	439000	38200
1-27	Balance ball	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		462	462	462	0.4

*Detection limit (L.O.D) raised to < 50

Table 3.39 Results of quantitative analyses in %(m/m), balance balls

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %	a %	b %	Average %	SD %
1-13	Balance ball	0.012	0.011	0.012	0.0001	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*	
1-14	Balance ball	0.071	0.067	0.069	0.003	0.003	0.001	0.002	0.001	< L.O.D*	< L.O.D*	< L.O.D*		42.6	45.8	44.2	2.3
1-15	Balance ball	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		<0.005	<0.005	<0.005	
1-21	Balance ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.869	0.902	0.885	0.023
1-22	Redondo ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D*	< L.O.D*	< L.O.D*	
1-23	Mini ball	10.8	11.0	10.9	0.2	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.037	0.037	0.037	0.0001
1-24	Training ball	36.5	34.2	35.4	1.7	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.0004	0.0014	0.0009	0.0007
1-25	Redondo ball	0.001	0.001	0.001	0.00002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.012	0.013	0.013	0.0005
1-26	Balance ball	0.030	0.029	0.030	0.0006	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		46.6	41.2	43.9	3.9
1-27	Balance ball	< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		< L.O.D*	< L.O.D*	< L.O.D*		0.046	0.046	0.046	0.00004

*Detection limit (L.O.D) raised to < 0.005

Table 3.40 Results of quantitative analyses in g/m^2, balance balls

		DIBP				DBP				BBP				DEHP			
Product no.	Type	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2	a g/m^2	b g/m^2	Average g/m^2	SD g/m^2
1-13	Balance ball	0.136	0.134	0.135	0.0009	<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*	
1-14	Balance ball	0.961	0.912	0.937	0.035	0.039	0.016	0.028	0.016	<L.O.D*	<L.O.D*	<L.O.D*		575	620	598	31
1-15	Balance ball	<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*	
1-21	Balance ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		13.0	13.5	13.2	0.4
1-22	Redondo ball	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		<0.05	<0.05	<0.05	
1-23	Mini ball	447	457	452	7	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		1.54	1.53	1.54	0.006
1-24	Training ball	253	237	245	12	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.0031	0.0097	0.0064	0.0047
1-25	Redondo ball	0.0086	0.0083	0.0084	0.0002	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		0.113	0.120	0.116	0.005
1-26	Balance ball	0.384	0.373	0.379	0.008	< L.O.D	< L.O.D	< L.O.D		< L.O.D	< L.O.D	< L.O.D		590	521	556	49
1-27	Balance ball	<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*		<L.O.D*	<L.O.D*	<L.O.D*		0.888	0.889	0.889	0.001

*Detection limit (L.O.D) raised to < 50

3.10.2 Comments to quantitative analyses of balance balls

A high content of DEHP was detected in two balance balls (no. 1-14, 1-26) both in concentrations of 44 %(m/m) and a high content of DIBP was detected in two balance balls (no. 1-23 and 1-24) in concentrations of 11% and 35%, respectively.

In a number of balance balls DIBP, DBP and DEHP were detected in smaller concentrations, less than 1 %(m/m).

BBP was not detected in any of the balance balls in excess of the stated detection limit of 0.001 %(m/m).

The detection limit was increased to 0.005% for a number of products due to interference of other compounds.

DINP was detected in several balance balls as stated in Table 3.41. It has not been investigated in this project whether the products contained other phthalates.

Table 3.41 Outline of other phthalates detected in balance balls

Phthalate abbreviation	Name	CAS-no.	Product no.
DINP	Di-isononyl phthalate	28553-12-0	1-15, 1-21, 1-22, 1-23 og 1-27

3.11 Summary of quantitative analysis results

Analysis of the 9 product groups showed that the four selected phthalates could be detected in 8 of the product groups.

There was found high concentrations of DEHP and DIBP in some product groups. This is the case for furniture, shower curtains, airbeds, oilcloth and dinner mats and balance balls.

For the product group floor covering only one product contained one of the four phthalates (DIBP) in more than 1 % (m/m). For wall linings one or two of the four phthalates were present in 11 products (except BBP) but in very low concentrations (0.001-0.005 % (m/m)). The same was the case for lamp shades. In the lamp shades low concentrations of DIBP, DBP or DEHP were present in five products (0.004-0.21% (m/m)).

A high content of DINP were detected in a wide range of products but have not been quantified in this project.