



National Institute for Public Health  
and the Environment  
*Ministry of Health, Welfare and Sport*

## **Cosmetovigilance in The Netherlands**

Overview of the period 2009-2014

RIVM Letter report 2014-0025

L. de Wit-Bos et al.





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## Colophon

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## Publiekssamenvatting

### **Huidklachten door cosmetische producten**

Overzicht van de jaren 2009 – 2014

Cosmetica zijn in principe veilig, maar kunnen soms huidklachten veroorzaken, zoals roodheid en jeuk. Het RIVM beheert een systeem waarin deze klachten en andere overgevoeligheidsreacties na gebruik van cosmetica kunnen worden geregistreerd (CESES, Consumer Exposure Skin Effects and Surveillance). In 2014 bestond dit systeem vijf jaar. Dit rapport geeft een overzicht van de informatie die met behulp van CESES is vergaard.

In deze periode zijn 2283 klachten door consumenten gemeld en 450 gevallen van allergische reacties op cosmetica door dermatologen. Er worden vooral klachten op het gezicht en op de handen gemeld na gebruik van huidverzorgingsproducten voor het gezicht, haarproducten en make-up. Symptomen bij deze klachten zijn voornamelijk roodheid, jeuk en een schilferige, schrale huid. In sommige gevallen treden ernstigere klachten op, zoals haaruitval en ademhalingsmoeilijkheden. Dit gebeurt vooral bij een allergische reactie op haarproducten.

Ingrediënten in cosmetica die het vaakst allergische reacties veroorzaken zijn isothiazolinonen, een groep conserveringsmiddelen, en geurstoffen. De Europese Commissie bereidt daarom een verbod voor op het gebruik van methylisothiazolinon in cosmetica die op de huid blijft zitten (*leave on*), zoals crème en bodylotion. Voor producten die worden afgespoeld (*rinse off*), zoals douchegel, gaan waarschijnlijk lagere maximale concentraties gelden. Ook het UV-filter octocryleen, dat bijvoorbeeld in zonnebrandcrème zit, heeft momenteel de aandacht. De Europese Commissie heeft de lidstaten gevraagd om meer informatie te verzamelen over allergische reacties op octocryleen, zodat een eventuele toename ervan zichtbaar kan worden gemaakt.

CESES wordt gebruikt om na te gaan of Europese wetgeving en handhaving de consument voldoende beschermt. Ook kunnen er risico's voor werknemers mee worden geïdentificeerd. Consumenten kunnen zelf hun klacht melden via de website [www.cosmeticaklachten.nl](http://www.cosmeticaklachten.nl). Daarnaast registreren deelnemende dermatologen huidklachten van patiënten waarbij cosmetica de mogelijke oorzaak zijn. Bij deze patiënten wordt vervolgens een allergieonderzoek uitgevoerd om vast te stellen welk productingrediënt de klacht veroorzaakt.



## Abstract

### **Cosmetovigilance in The Netherlands**

Overview of the period 2009 - 2014

Cosmetics are in principle safe to use. In some cases however, cosmetic products may lead to undesirable reactions, such as itching and erythema. RIVM has set up a monitoring system in which undesirable reactions as well as other allergic reactions caused by cosmetics can be registered (CESES, Consumer Exposure Skin Effects and Surveillance). In 2014, this system existed five years. This report provides an overview of the information gathered within CESES.

In this period, 2283 consumer reports and 450 reports of dermatologists of undesirable reactions were received. Such reactions are mainly reported to occur on the face and hands after using skin products, especially facial care products, hair products and make-up. Symptoms are primarily erythema, itching and scaling and a burning sensation. More severe reactions, including hair loss and breathing problems, appear in some cases, mainly in case of an allergic reaction to hair products.

Isothiazolinones, a preservative in cosmetics, and fragrances are the cosmetic ingredients relatively most responsible for allergic reactions. As such, the European Commission is working on a prohibition of the use of methylisothiazolinone in leave-on cosmetics, such as cream and body lotion. For the use in rinse-off products, such as shower gel, the maximum permitted concentration will most likely be lowered. In addition, the UV filter octocrylene, used in for example sunscreens, receives a lot of attention. The European Commission asked the EU member states to provide data to help identify clear trends in increase of allergy to octocrylene.

The goal of CESES is to monitor undesirable reactions attributable to cosmetics and cosmetic ingredients to assess whether current EU legislation on cosmetics provides adequate consumer protection. Consumers can report allergic reactions on the website [www.cosmeticaklachten.nl](http://www.cosmeticaklachten.nl). In addition, participating dermatologists report cases of contact dermatitis to the system when cosmetics are expected to be the cause. Dermatologists also carried out patch tests and, where necessary, tests with specific batch ingredients of the associated cosmetic product.





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## Summary

In July 2014, the registration of undesirable reactions attributed to cosmetics within the Consumer Exposure Skin Effects and Surveillance (CESES) project existed five years. The cosmetovigilance system registered in total a number of almost 3000 cases of undesirable reactions via the consumer route, reports of general practitioners and reports of dermatologists. In the current report, an overview of the reports from consumers and dermatologists in the period July 2009 – October 2014 is presented.

In this period, 2283 consumers reported relevant cases of undesirable reactions. The reactions were mainly localised on or around the eyes/eyelashes and on the face, which is well in line with the location where most of the cosmetics are applied, and symptoms primarily included erythema, itching and a burning sensation. Reported cosmetic products were mainly facial care products, make-up and hair products, and sunscreens, when corrected for market share. A large part of the consumers applied self-treatment and did neither visit a general practitioner nor a dermatologist.

Participating dermatologists reported 450 cases of undesirable reactions. The undesirable reactions were primarily located on the face and hands, and were mainly characterised by erythema, itching and scaling, and in a five cases by breathing problems whether or not accompanied by dizziness and unconsciousness. The most frequently reported product categories are hair products and skin products. Occupational exposure to allergens was probably related to the development of the undesirable reaction in about a quarter of the patients.

For 448 patients, diagnostic patch testing was performed by the dermatologists to identify one or more cosmetic ingredients (probably) responsible for the undesirable reaction. Patch testing with the European baseline series showed that the most prevalent allergens were fragrance mix I (24%), nickel sulphate (22%) and the mixture of methylchloroisothiazolinone (MCI) and methylisothiazolinone (MI) (20%). Taking all isothiazolinones together, also including 2-n-octyl-4-isothiazolin-3-one (OIT) and 1,2-benzisothiazolin-3-one (BIT), this group of preservatives are responsible for a positive test response in 31% of the patients.

The consumer reports and reports of dermatologists have yielded insight in the current situation of cosmetic allergy in the Netherlands. They provided more insight in the incidence and prevalence of undesirable reactions to cosmetics, and assisted in the identification of cosmetics and product ingredients, such as isothiazolinones and octocrylene, responsible for undesirable reactions. In addition, the reports offered information that can be used for intervention in case of potential health concerns by the Early Warning system. Finally, the cosmetovigilance system also provided the opportunity to share valuable data between a network of dermatologists, NVWA and RIVM and to disseminate informative data at the European level.



## 1 Introduction

In July of 2014, the registration of undesirable reactions<sup>1</sup> attributed to cosmetics within the Consumer Exposure Skin Effects and Surveillance (CESES) project existed five years. The cosmetovigilance system CESES was set-up by order of the Netherlands Food and Products Authority (NVWA) and the Dutch ministry of Health, Welfare and Sport. From 2009 until now<sup>2</sup>, 450 reports of dermatologists and 2283 usable consumer reports have been received. In addition, during the years 2010 and 2011, 243 reports were handed over by 42 general practitioners (GPs) participating in the CMR Sentinel GP Network of the Netherlands Institute for Health Services Research (NIVEL). Thus, the cosmetovigilance system registered in total a number of almost 3000 cases of undesirable reactions probably attributed to the use of cosmetic products. A complete overview of the background and the set-up of the CESES project can be found in previous reports (Salverda-Nijhof et al., 2011; de Wit-Bos et al., 2012).

In this report, an analysis of all consumer reports and reports of dermatologists received in the last five years is provided. The analysis of all reports registered by GPs was already conducted in the annual report of 2012 (de Wit-Bos et al., 2012). Chapter 2 gives an overview of the received consumer reports, while Chapter 3 discusses the reports of dermatologists and provides the analysis of all patch tests performed. In Chapter 4 an overview of the Early Warnings sent to the NVWA since the start of CESES is given. Chapter 5 contains a discussion of the results obtained in the last five years and the proceeds of the CESES project. Finally, Chapter 6 contains the conclusions and recommendations.

<sup>1</sup> Within the CESES project, an undesirable reaction is defined as any adverse effect attributed to the use of cosmetics under reasonably foreseeable conditions.

<sup>2</sup> Reports are included for the present report up to 1 October 2014



## 2 Overview of consumer reports

### 2.1 Number of undesirable reactions

In total, 2404 cases of undesirable reactions to cosmetic products have been reported by consumers within the CESES project via the dedicated website [www.cosmeticaklachten.nl](http://www.cosmeticaklachten.nl) or via the NVWA call centre. Of these reports, 5% (n=121) was excluded because no detailed information on the cosmetic product was available or the product mentioned was not a cosmetic product according to the definition in the Cosmetic Products Regulation<sup>3</sup>. Consequently, 2283 consumer reports could be used for analysis.

Figure 2-1 provides an overview of the received consumer reports per year. The number of reports decreased steadily over the years with especially a considerable decline in 2013 and 2014. In previous years, the annual report provided a trend analysis by analysing the consumer reports received in the period from October till October the following year and comparing the results between earlier periods. However, due to the limited number of reports received between October 2013 and October 2014 (n=82), no separate analysis of these reports, and subsequently no trend analysis, is made.

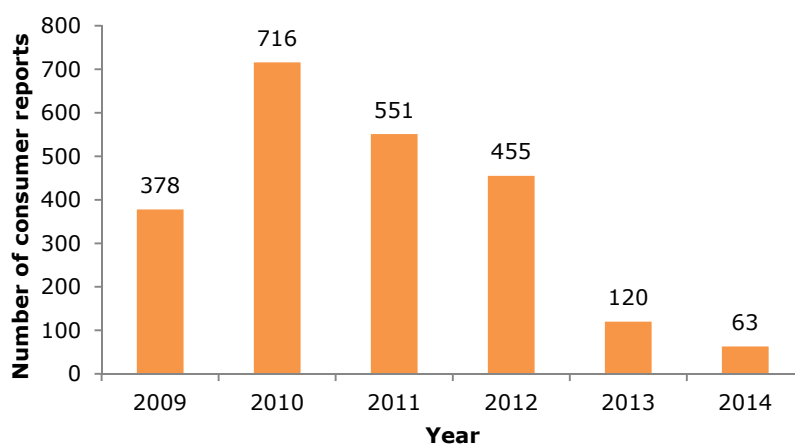


Figure 2-1 Number of consumer reports per year (for 2009 the number of reports since the start in November; for 2014 the number of reports until 1 October) received within the CESES project.

### 2.2 General description

The demographic characteristics of the consumers who reported undesirable reactions via the consumer route within CESES are presented in Table 2-1. Most undesirable reactions were reported by women (92.5%, n=2113) between 20 and 40 years old (62.6%). The youngest consumer for which an undesirable reaction was reported was 0 years and the oldest 92 years. The average age of the consumer population reporting an undesirable reaction in CESES is 40 years.

<sup>3</sup> Cosmetic Products Regulation EC No 1223/2009

Table 2-1 Demographic characteristics of the 2285 consumers who reported undesirable reactions

Demographic characteristic	Characteristic specified	Number (percentage)
Gender	male	170 (7%)
	female	2113 (93%)
Age (years)	0-9	32 (1%)
	10-19	166 (7%)
	20-29	458 (20%)
	30-39	471 (21%)
	40-49	501 (22%)
	50-59	386 (17%)
	60-69	222 (10%)
	>69	47 (2%)

### 2.3 Description of undesirable reaction

Figures 2-2 and 2-3 show the reported symptoms by which the undesirable reaction could be characterised and the location of the undesirable reaction, respectively. Overall, the undesirable reactions were mainly characterised by erythema (18%, n=1643), itching (17%, n=1559), and a burning sensation (14%, n=1331). Severe reactions, such as breathing problems and hair loss, were mainly associated with the use of hair products. The majority of the undesirable reactions occurred around the eyes or on the eyelashes (30%, n=1445) and on the face (20%, n=1001). This is well in line with the location where most of the cosmetic products, allegedly responsible for the reaction, are used. The cosmetic products were primarily applied on the on the face (27%, n=871) followed by on/around the eyes and eyelashes (22%, n=701).



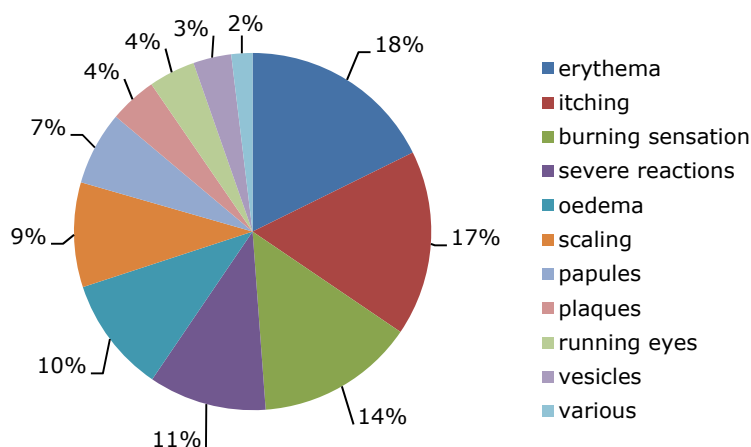


Figure 2-2 Reported symptoms of undesirable reaction after cosmetics use in % (n=9282). The category various includes among others hyper- and hypokeratosis. Severe reactions include blistering, nausea, pain, breathing problems, burns, dizziness and hair loss.

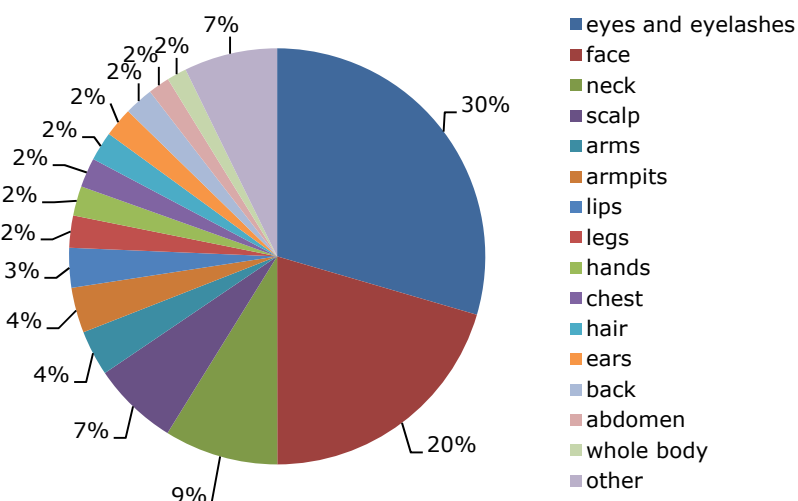


Figure 2-3 Reported location of undesirable reaction after cosmetics use in % (n=4893). The category other includes among others feet and nails.

For most consumers that filled in the CESES questionnaire (70%, n=1593), it was the first time they had a reaction after using cosmetics. Of the consumers who had experienced undesirable reactions on cosmetics before, the majority (70%, n=485) indicates that the current reaction was equally severe. The undesirable reaction appeared in most cases (66%, n=1515) on the same day as the cosmetic product was applied, according to the consumer reports. For about a quarter of these consumers (26%, n=388), it developed within 30 minutes. At the time of completing the CESES questionnaire, 60% (n=1378) reported to still suffer from the undesirable reaction.

## 2.4 Cosmetic products

The consumers were in 88% (n=2011) of the cases able to report one or more cosmetic products allegedly responsible for the undesirable reaction. As can be observed in Figure 2-4 showing the product categories to which the reported

cosmetics belong, mostly skin products (37%, n=808), make-up (30%, n=652) and hair products (15%, n=326) were mentioned to be the cause.

Detailed analysis of these product categories shows that the main product types allegedly responsible for the reactions are: facial care products (72%, n=583), more specifically leave-on day and night creams (77%, n=446) and facial cleaning products (18%, n=146) for the skin products; eye make-up (79%, n=517), such as mascara, eye liner and eye shadow for make-up; and (permanent) hair dyes (54%, n=177) and hair care products (39%, n=127), such as shampoos, for the hair products.

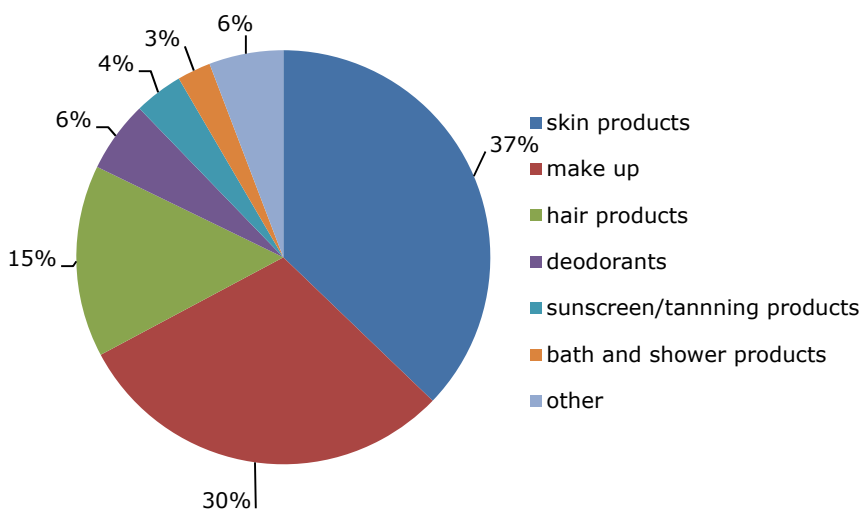


Figure 2-4 Reported product categories that probably caused undesirable reaction in % (n=2173). The category other includes perfumes, dental care products, shaving products and some other products.

Of course, the number of reported reactions per product group is also related to the quantity in which these product groups are sold. Logically, products that are sold in larger amounts are expected to give a higher number of reported reactions. Thus, for a fair comparison between product categories the number of reactions for a product category must be compared per % of market share (Table 2-2). For example, the number of reported reactions regarding make-up per % of market share equals  $652/15 = 44$ . The product category with highest number of reported reactions per % of market share is: make-up, followed closely by skin products, and sunscreen/tanning products.

Table 2-2 Relative contribution of product categories when corrected for market share  
(Source: NCV, 2013).

Product category	Market share (%)	Number of undesirable reactions CESES	Corrected for market share number per %	
Make-up	15	652	44	23%
Skin products	19	808	43	23%
Sunscreen/tanning products	3	83	28	15%
Shaving products	1	22	22	12%
Hair products	16	326	21	11%
Deodorant	7	121	18	9%
Bath and shower products	7	57	8	4%
Dental care products	7	19	3	1%
Soap	2	4	2	1%
Perfumes	19	28	1	<1%

## 2.5 Factors possibly related to the undesirable reaction

Factors other than the consumer use of cosmetic products that could be related to the undesirable reaction are (other) skin problems and underlying allergies and occupational exposure. A quarter of the consumers (n=565) reported to suffer from other skin problems, including irritant or allergic contact dermatitis (35%, n=197) and atopic dermatitis (21%, n=120). Almost four in ten (39%, n=894) reported to have underlying allergies, which were primarily allergies to pollen (43%, n=380), metals (30%, n=271), fragrances (26%, n=232) and food products (25%, n=225). Although details on their profession were not reported by the consumers, they reported in most cases (96%, n=2193) that it was not likely that their occupation is related to the undesirable reaction.

## 2.6 Diagnosis and treatment

Of the consumers who filled in the CESES questionnaire since the project started, 60% (n=1362) applied self-treatment (e.g. applying a soothing cream or refraining from using the cosmetic product), 37% (n=841) went to visit a general practitioner (GP) and 12% (n=263) was redirected by the GP to see a dermatologist.

Refraining from using the cosmetic product did not lead to the disappearance of the undesirable reaction in almost a quarter (24%, n=544) of the reported reactions. This could be due to the fact that the cosmetic product was not responsible for developing the reaction or alternative products resulted in the same problems. Most consumers that went to see a GP (86%, n=721) were advised to start treatment which included mainly the prescription of corticosteroid cream or antihistamines medication or a combination of both. The consumers that were referred to a dermatologist received treatment in most cases (68%, n=180) consisting of the application of a (corticosteroid) cream (n=160) and undergoing a patch test (n=179). Patch test results show that 80% (n=143) had a positive response to one or more allergens, such as nickel, colophonium or fragrances.

## 2.7 Contact to manufacturer or retailer

Contact with the manufacturer or retailer of the cosmetics was barely sought by the consumers: 16% (n=369) went back to the shop where the cosmetic product was bought and only 10% (n=234) contacted the manufacturer.



## 3 Overview of reports of dermatologists

### 3.1 Number of undesirable reactions

Since the start of CESES, 450 reports of undesirable reactions attributed to cosmetics have been reported by participating dermatologists. Per year the following number of reports was received: 50 reports (2009, start in July), 76 reports (2010), 96 reports (2011), 118 reports (2012), 72 reports (2013), and 40 reports (2014, until October).

In the previous two annual reports, in order to allow a trend comparison, reports that were both initiated and finalised in the period from October till October the following year were analysed separately next to an overall analysis of the data (de Wit-Bos, 2012 & 2014). This separate analysis is however not made for the current annual report as the number of reports received and finalised in the period October 2013 – October 2014 was very low (n=25). Hence, in this Chapter the results of an overall analysis of all data received during the last five years will be presented.

During the last five years, the pool of participating dermatological centres increased. To date, ten dermatological centres joined the CESES project at some point in time (presently: nine centres). Figure 3-1 shows the participating centres and the number of cases that have been reported by them up to now.

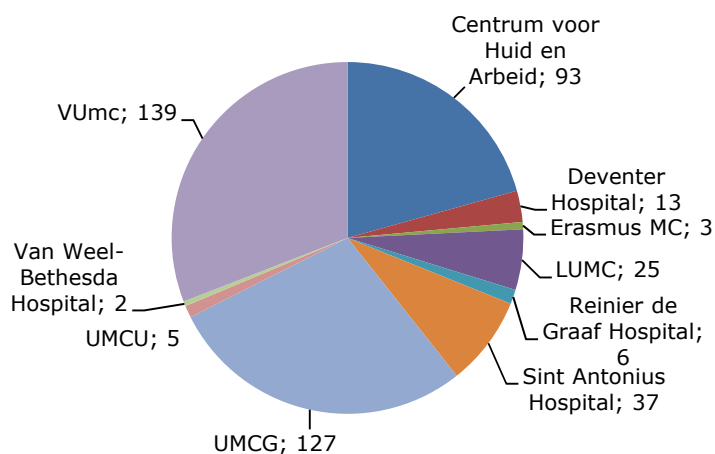


Figure 3-1 Number of usable reports per participating dermatological centre since the start of CESES.

### 3.2 General description

Demographic characteristics (gender, age and possible relationship with their occupation) of the 450 patients that visited a participating dermatologist are presented in Table 3-1. In general, undesirable reactions probably attributed to cosmetics are mostly reported for women (84%) in the age group between 20 and 29 years of age (26%).

Table 3-1 Demographic characteristics of the 450 patients who visited a dermatologist

Demographic characteristic	Characteristic specified	Number (percentage)
Gender	male	70 (15%)
	female	377 (84%)
	unknown	3 (1%)
Age (years)	0-9	5 (1%)
	10-19	39 (9%)
	20-29	119 (26%)
	30-39	64 (14%)
	40-49	79 (18%)
	50-59	80 (18%)
	60-69	53 (12%)
	70-79	7 (2%)
	>80	1 (<1%)
	unknown	3 (<1%)

### 3.3 Description of undesirable reaction

Figures 3-2 and 3-3 show the reported symptoms by which the undesirable reaction could be characterised and the location of the undesirable reaction, respectively. The undesirable reaction of the patients could be mainly characterised by erythema (24%, n=402), itching (22%, n=360), and scaling (18%, n=294). Five patients were reported to react at the cosmetic product (in all cases hair dyes) with breathing problems, of which two of them reported also dizziness and unconsciousness. The majority of the undesirable reactions occurred on the face (26%, n=213) and on the hands (20%, n=157).

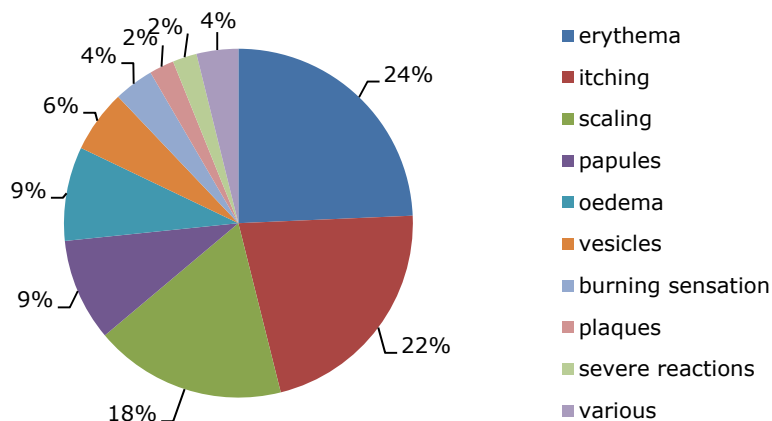


Figure 3-2 Reported symptoms of undesirable reaction after cosmetics use in % (n=1662). The category various includes among others hyper- and hypokeratosis. Severe reactions include unconsciousness, pain and dizziness.

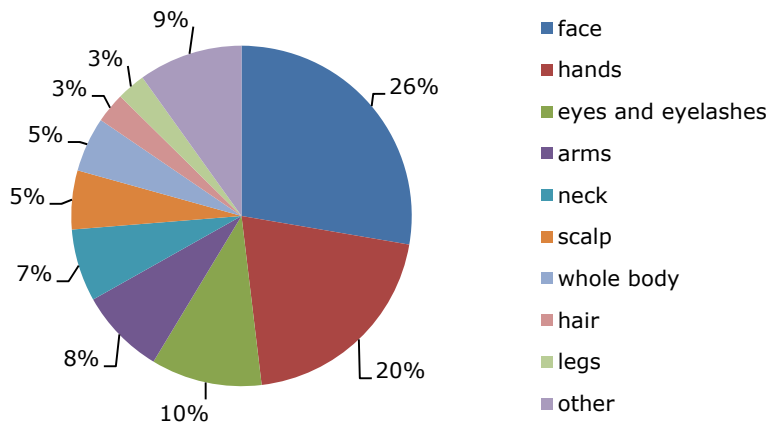


Figure 3-3 Reported location of undesirable reaction after cosmetics use in % (n=804). The category other includes among others feet and legs.

Most patients stated that they did not know when the undesirable reaction has started, but 61% (n=274) still suffered from the reaction when they visited the dermatologist. For 59% (n=268) it was the first time they had an undesirable reaction to the respective cosmetic product. It is unclear how the seriousness of the current response related to the previous response for patients who experienced an undesirable reaction on the same product before.

### 3.4 Cosmetic products

The cosmetic product(s) allegedly responsible for the reaction were reported for 96% (n=434) of the patients. Figure 3-4 shows the product categories to which the reported cosmetics belong. These include mostly hair products (44%, n=324), skin products (25%, n=180) and make-up (8%, n=59).

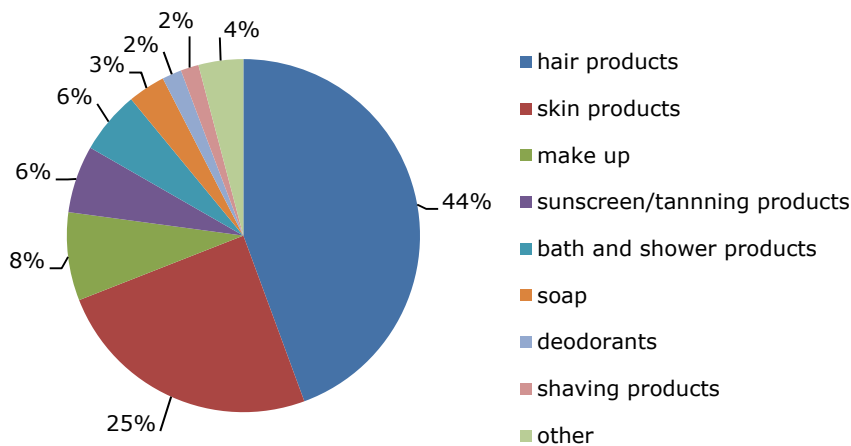


Figure 3-4 Reported product categories that probably caused undesirable reaction in % (n=730). The category other includes perfumes, child care products, dental care products and some other products.

Looking at these product categories in more detail, the main product types causing reactions are: (permanent) hair dyes (43%, n=139) and hair care products (31%, n=101) for the hair products; facial care products (39%, n=70), more specifically leave-on day and night creams, and body care products (30%,

n=54) for the skin products; and eye make-up (68%, n=40), such as mascara, eye liner and eye shadow for make-up.

### **3.5 Factors possibly related to the undesirable reaction**

For most patients (73%, n=328), there is no relation expected between their occupation and the undesirable reaction. Cases in which a relation is expected concern primarily hairdressers. Underlying skin problems, mostly atopic dermatitis, were noted for 103 patients (23%). Other allergies were reported for 120 patients (27%) and included mainly allergies to fragrances and metals. Twenty-eight patients (6%) suffered from both an underlying skin problem and an allergy.

### **3.6 Diagnosis and treatment**

Of all patients that were included in the CESES project, 408 patients (91%) received a final diagnosis up to now. Based on the medical history, physical examination and the results of diagnostic patch testing, 57% of these patients (n=233) was diagnosed with allergic contact dermatitis. Further, 11% (n=45) was diagnosed with a combination of allergic contact dermatitis and irritant contact dermatitis. Treatment was adjusted based on the final diagnosis in 24% of the cases (n=106). Treatment consisted mainly of refraining from using the cosmetic product.

### **3.7 Patch tests**

In the last five years, a total of 448 patients (>99%) have been patch tested with the European baseline series (including methylisothiazolinone (MI)). Of these patients, 94% (n=424) showed a positive response to one or more tested allergens. The top 10 of allergens leading to positive responses are shown in Table 3-2. The most positive responses were observed to fragrance mix I (24%), nickel sulphate (22%) and the mixture of methylchloroisothiazolinone (MCI) and MI (20%). When looking at all isothiazolinones together, also including 2-n-octyl-4-isothiazolin-3-one (OIT) and 1,2-benzisothiazolin-3-one (BIT), this group of preservatives are responsible for a positive test response in 31% of the patients.



Table 3-2 Patch test results (top 10) with European baseline series and additional substances in patients seen by participating dermatologists since the start of the CESES project in 2009

Allergen	% positive
fragrance mix I <sup>4</sup>	24%
nickel sulphate <sup>5</sup>	22%
methyl(chloro)isothiazolinone (Kathon CG ® (MCI/MI (3:1)))	20%
fragrance mix II <sup>6</sup>	17%
p-phenylene diamine (PPD)	15%
cocamidopropyl betaine (CAPB)	12%
ammonium persulfate	10%
methyldibromo glutaronitrile (MDBGN) <sup>4</sup>	10%
methylisothiazolinone (MIT)	9%
myroxylon pereirae (Peru balsem)	9%

An additional patch test with the batch-specific ingredients of the cosmetic product was requested for 170 patients (38%) up to now. This additional patch test resulted in positive responses to one or more of the tested ingredients in 80 patients so far. The results show that 32 patients (40%) developed a reaction to surfactants and/or emulsifying agents, 16 patients (20%) to emollients, 15 patients (19%) to fragrances/masking compounds, 12 patients (15%) to skin conditioners, and 11 patients (14%) to viscosity controlling substances. Appendix I provides a detailed overview of the outcomes of the batch-specific patch tests.

### 3.8 Causality assessment

The causality assessment in CESES is conducted by a senior dermatologist based on the outcomes of the patch test with the European Baseline patch test series (only relevant cosmetic allergens) and the cosmetic product itself, the final diagnosis, and, when performed, the patch test with batch-specific ingredients of the cosmetic product. A clear relationship between the undesirable reaction and the reported cosmetic product(s) could be established in 364 (89%) of the 410 patients for which the causality is assessed up to now. For 172 patients (42%) this causality was likely and for 192 patients (47%) very likely. The causality was unlikely or questionable for 46 patients (11%).

<sup>4</sup> Fragrance mix I contains cinnamyl alcohol, cinnamaldehyde, eugenol, alpha-amyl-cinnamaldehyde, hydroxycitronellal, geraniol, isoeugenol and *Evernia prunastri* (oak moss absolute).

<sup>5</sup> The use of nickel sulphate and methyldibromo glutaronitrile (MDBGN) in cosmetics is prohibited, which means that these reactions are likely not the result of using cosmetics at the present time.

<sup>6</sup> Fragrance mix II contains alpha-hexyl-cinnamaldehyde, citral, citronellol, farnesol, coumarin and hydroxyisohexyl 3-cyclohexene carboxaldehyde (Lyréal ®).



## 4 Early Warning

One of the objectives defined within CESES is offering information that can be used for an intervention in case of potential health concerns. For this objective, an Early Warning system was set up to warn the NVWA in case severe undesirable reactions occurred or in case a high frequency of undesirable reactions attributed to one cosmetic product were reported. Table 4-1 provides an overview of some noteworthy cases where the NVWA was notified regarding a certain cosmetic product. In the five-year existence of CESES, thirty-eight Early Warnings have been sent to the NVWA.

Table 4-1 Early Warnings based on reports of undesirable reactions by consumers and dermatologists in the period 2009 - 2014

Product	Consumer reports	Reports dermatologists	Symptoms	Causality *	Follow up NVWA
Toothpaste	9	0	Burning sensation, erythema, vesicles, 'tongue and lips feel like being burned'	Not assessed	Data show that safety of toothpaste is thoroughly tested before marketing. Safety assessment does not indicate a risk. Complaints mainly based on different sensation in the mouth and different taste. Toothpaste has lower water content than normal toothpastes, which can be experienced as "grainy". Furthermore, toothpaste causes release of dead cells of oral mucous membrane into the mouth.
Eye make-up remover	14	2	Itching, erythema, burning sensation, oedema, scaling, pain, running eyes, 'wounds'	Very likely, product tested positive	Contact with manufacturer who concluded that there were too few complaints to doubt safety of product.
Udder cream	1	8	Erythema, itching, scaling, vesicles, oedema	Likely - very likely, product tested positive	Contact with manufacturer who indicated to reformulate the udder cream.
Sunscreen	4	1	Erythema	Very likely, product tested positive	-
Day and night cream / serum	23	0	Itching, erythema, burning sensation, burns, scaling, oedema, papules	Not assessed	Contact with manufacturer who concluded that it is probably a 'launch' effect, i.e. introduction of new product. Extra quality controls are undertaken.
Lipstick	16	0	Oedema, burning sensation, erythema, itching, scaling, vesicles	Not assessed	Contact with manufacturer who indicated that reactions may be experienced when use instructions are not followed correctly, i.e. not applying the top coat leading to dry lips. In addition, cases are too diverse to draw general conclusions.
Day and night cream	16	6	Burning sensation, running eyes, itching, erythema, oedema	Very likely, product tested positive	-
Sunscreens for	14	4	Itching, papules, erythema,	Likely - Very likely,	Monitoring number of reported cases

children			scaling, nausea, dizziness, burning sensation, oedema, breathing problems, vesicles	product tested positive	concerning sunscreens intended for children
Anti-wrinkle cream	11	1	Erythema, scaling, plaques, oedema, itching, vesicles, breathing problems, burning sensation, blistering	Very likely, product tested positive	-

\* Not assessed means no patch tests for confirmation were performed since all reports were done in the consumer route.



## 5 Discussion

### 5.1 Objectives CESES

During the five-year existence of CESES, 450 reports of dermatologists and 2283 usable consumer reports have been received. These reports have yielded insight in the current situation of cosmetic allergy in the Netherlands. In this way, the objectives of CESES 1) to provide more insight in the incidence and prevalence of undesirable reactions to cosmetics, 2) to assist in the identification of cosmetic products and product ingredients responsible for undesirable reactions, and 3) to offer information that can be used for an intervention in case of potential health concerns could be met. These data were shared between dermatologists, RIVM and NVA and also with the international community to meet the fourth objective on data-sharing.

### 5.2 Incidence and prevalence of undesirable reactions

The precise incidence and prevalence of undesirable reactions attributed to cosmetics cannot be established based on the data gathered within CESES. The real number of undesirable reactions is most likely much higher than the number of received reports. One reason for this is that consumers are not actively questioned but had to make the choice themselves to report undesirable reactions at the website, which on its turn is directly influenced by the public awareness of the existence of the website. Another reason is that a minority of the consumers, who reported an undesirable reaction at the website, visit a doctor (GP or dermatologist) with a reaction possibly caused by cosmetics: 37% visited a GP and only 12% was redirected to a dermatologist.

A crude estimate can be made however based on analysis of the number of reports of GPs that were gathered within CESES in 2010 and 2011. That is, analysis of these data by NIVEL shows that 10-13 per 10,000 patients visit a GP with skin reactions or other allergic reactions. This means that about 17,000 - 22,000 persons in The Netherlands visit a GP with undesirable reactions per year (Donker, 2012). As 37% of the consumers in CESES report to have visited a GP with their undesirable reaction, this means that in total about 45,000 - 60,000 persons in The Netherlands may suffer from cosmetic-related allergic skin reactions. It should be kept in mind though that reports from consumers and from GPs are not validated because the persons involved are not patch tested by a dermatologist. Therefore, a causal relation between the undesirable reaction and the use of cosmetics is not established in these cases. The estimation of 45,000 - 60,000 persons in The Netherlands suffering from cosmetic-related skin reactions should be taken as a rough estimate.

### 5.3 Identification of cosmetic products and product ingredients

CESES has provided insight in the type of cosmetic products that are (probably) responsible for the development of undesirable allergic reactions. In absolute numbers, skin products, make-up and hair products are the product categories most frequently mentioned by consumers. More specifically, leave-on day and night creams, eye make-up and hair dyes are relatively most related to developing undesirable reactions. This is also expected as these product categories form the top three of most used cosmetic products based on their market share. When corrected for the respective market shares, sunscreens and

tanning products become important in relation to developing undesirable reactions.

Based on the results of the patch tests with either the European baseline series or specific batch ingredients, several allergens came up as noteworthy the past five years<sup>7</sup>. For some of these, it was not expected that they would result in allergic reactions, such as for the UV filters benzophenone-3 and octocrylene, and the cross/copolymers. Also the isothiazolinone MI was thought to be less allergenic than MCI/MI when it was introduced as a preservative. For other allergens, such as fragrances in general and hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC, Lyrall®) in particular and the strong oxidising agent ammonium persulfate, the monitoring project CESES attributed to the recognition that these cosmetic ingredients are important allergens to monitor and, when needed, to take actions to lower the exposure to these. Hence, CESES has proven its value with respect to identification of important cosmetic allergens by signalling these issues and contributing to action at the European level since partly due to CESES actions are now being taken with respect to MI and octocrylene. This will be further discussed below.

Isothiazolinones are with no doubt the most frequently positively tested allergens within CESES. The relatively high number of positive responses to these preservatives is in line with observations in other EU countries, showing a growing number of allergic reactions to isothiazolinones and especially MI (Aerts et al., 2014; Geier et al., 2012; Hosteing et al., 2014; Lammintausta et al., 2014; Madsen & Andersen, 2014; Schwensen et al., 2014; Uter et al., 2012). As this problem is recognized by both industry and government, actions are currently undertaken to discontinue the use of MI in leave-on products and lower the maximum permitted concentration in rinse-off products from 100 ppm to 15 ppm (Cosmetics Europe, 2013; SCCS, 2013). The dilemma here is that the use of only 15 ppm may not lead to a sufficient conservation, which therefore indirectly implies a ban on the use of MI as preservative in cosmetics. Also, the Scientific Committee on Consumer Safety (SCCS) concluded that it is not safe to add MI to a cosmetic product already containing MCI/MI. Notwithstanding these steps forward, isothiazolinones are also widely applied in several other consumer products without maximum permitted levels. Furthermore there is not always information on the presence of MI in the respective product, as there is no harmonised classification of MI as a skin sensitizer (SCCS, 2013; Schwensen et al., 2014). It is as such recommendable to assess the exposure to MI and other isothiazolinones from all consumer products and to further map the part of the population that is sensitized to isothiazolinones. In this way, more insight is gained and will enable a better control of the isothiazolinone-induced allergies.

As a result of six cases of positive responses to octocrylene within CESES and the fact that several case reports of contact dermatitis in children and mostly photoallergic contact dermatitis in adults are published in the scientific literature, a presentation about octocrylene was given by The Netherlands during the European Commission's Working Group on Cosmetics. In reaction to this presentation, Sweden proposed a statement to limit the use of octocrylene in cosmetic products. There is however discussion about the cause of the increased number of allergic reactions to octocrylene. Photosensitization to the anti-inflammatory drug ketoprofen leads, in many cases, to photocontact allergy

<sup>7</sup> For a discussion of these cosmetic ingredients, see the previous reports about CESES (Salverda et al., 2011; de Wit-Bos et al., 2012 & 2014).



to octocrylene. Contact allergy also occurs, but less frequently, and is observed in most cases in children (de Groot & Roberts, 2014). Meanwhile, actions are undertaken to minimize the exposure to ketoprofen, for example by limiting the availability of this drug by making it only obtainable on doctor's prescription. Awaiting the influence of this measure on the prevalence of positive responses to octocrylene, the EC demanded the EU member states to provide cosmetovigilance data to help identify clear trends in increase of allergy to octocrylene in the EU.

Next to the identification of cosmetic products and ingredients as probable cause for undesirable reactions, CESES has also proven to be able to identify specific occupational groups, i.e. hairdressers, that are subject to contact dermatitis caused by specific cosmetic products and ingredients, i.e. ammonium persulfate and PPD in hair dyes for hairdressers, with detrimental consequences, such as unemployment (see de Wit-Bos et al., 2012 & 2014).

#### **5.4 Intervention in case of potential health concerns**

The Early Warning system in CESES has the aim to notify the NVWA in case severe undesirable reactions occurred or relative many undesirable reactions were reported about the same cosmetic product in a short period of time. Using also the consumer route for detection of potential health concerns next to the dermatological route is unique in the world. As it is recognized that the majority of the consumers do not seek medical advice in case of undesirable reactions to cosmetics, the consumer route has proven to be of great value to monitor undesirable reactions and intervene quickly when needed. The Early Warning system in CESES is moreover important since many undesirable reactions do not fall under the definition of a serious undesirable effect (SUE)<sup>8</sup> which the cosmetic industry is obliged to report to Competent Authorities (CAs). As has been described in Chapter 4, several Early Warnings were sent the past five years to the NVWA and appropriate action was undertaken.

#### **5.5 Exchanging data**

The final objective was to provide a forum where data could be exchanged. Of course this objective is reached by the fact that data are shared by consumers via the website [www.cosmeticaklachten.nl](http://www.cosmeticaklachten.nl) and that a network of dermatologists was set up to share data about patients who visit these dermatologists with cosmetics-related allergic reactions. But also at a higher level CESES provided the opportunity to share data. A number of scientific publications, with relations to the CESES project, have been published:

- the results of the CESES project until May 2011 (Salverda et al., 2013);
- a case report regarding menthoxypropanediol in a lip cosmetic (Franken et al., 2013);
- a review about the UV filter octocrylene (de Groot & Roberts, 2014);
- case reports regarding octocrylene obtained within CESES (de Groot et al., 2014a);
- a case report about Tinosorb® M (de Groot et al., 2014b);
- case reports on capryloyl salicylic acid (de Groot et al., 2014c).

In addition, data obtained within CESES were shared in Europe at the Cosmetovigilance Workshop organised by the EC (Brussels, May 2012) and at the meetings of the EC's Working Group and Standing Committee on

<sup>8</sup> SUEs are defined as such that only extreme severe reactions will be registered by industry and notified, i.e. in case of temporary or permanent functional incapacity, disability, hospitalisation, congenital anomalies or an immediate vital risk or death.

Cosmetics. This dissemination at the European level has contributed to a revised opinion on isothiazolinones and more attention for octocrylene for example.

## **5.6 Continuation of CESES**

In 2015, the NVWA will not continue the separate consumer route of CESES. For this reason, consumers who want to report undesirable reactions from cosmetics via the website [Cosmeticklachten.nl](http://Cosmeticklachten.nl) are (from the end of October 2014) directed to the website 'Melden en vragen voor consumenten' of the NVWA. The NVWA is planning to use the CESES questionnaire rather than the more general form presently used, in the near future. As a consequence of concluding the consumer route of CESES, the RIVM will no longer store nor analyse consumer reports on cosmetics. Nevertheless, the clinical route, funded by the Ministry of Public Health, Welfare and Sport, will be continued in 2015 and beyond.

## 6 Conclusion and recommendations

- In its five-year existence, CESES has proven to be a valuable system for cosmetovigilance in The Netherlands. This is especially due to the unique combination of reports of consumers and dermatologists.
- Undesirable reactions attributed to cosmetics occur mainly on the face and hands after using skin products, especially facial care products, hair products and make-up. Symptoms are primarily erythema, itching, scaling and a burning sensation. More severe reactions, including hair loss and breathing problems, appear in some cases, mainly in case of an allergic reaction to hair products. The most prevalent cosmetic allergens are isothiazolinones and fragrances.
- Thirty-eight Early Warnings have been sent to the NVWA when severe undesirable reactions occurred or in case a high frequency of undesirable reactions attributed to one cosmetic product were reported.
- The information obtained within CESES was useful to assess whether current EU legislation on cosmetics provides adequate consumer protection. CESES actively contributed to the international attention, and subsequent steps towards intervention, for isothiazolinones and octocrylene.
- The consumer route will be discontinued in 2015 in terms of storage and analysis of consumer reports by RIVM. Consumers will however still be able to report their undesirable reactions via [www.cosmeticaklachten.nl](http://www.cosmeticaklachten.nl). Hence, continuous communication to the public about the possibility to report undesirable reactions remains of utmost importance for a successful cosmetovigilance in The Netherlands. The clinical route will be continued in 2015 and beyond.



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## Appendix I Outcomes CESES-specific patch testing with batch ingredients performed by dermatologists

Overview of products and ingredients tested positive divided by product and patient number. – negative response, ? doubtful response, + positive response, ++ strong positive response, NT not tested, NS not stated. \* from literature # concentration set by working group on test concentrations. NB. All responses are reported, including non-relevant responses or false positives/negatives.

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
535	Shampoo			5% aq* (open test)	-	+	NT
	magnesium chloride	viscosity controlling	5% aq*	5% aq*	-	Irritation	NT
	picrotone olamine	preservative	1% pet	1% pet*	?	-	NT
	sodium laureth sulfate (Emal)	surfactant		0.5% aq	-	?	NT
	sodium laureth sulfate (Genapol)	surfactant		0.5% aq	-	?	NT
545	Cream				-	-	NT
	butyrospermum parkii butter	skin conditioning/emollient	30% mo	30% mo	-	+	+
545	Body milk			as is*	-	+	-
553	Cream			as is*	-	-	+
557	Cream			as is*	-	-	-
	panthenol	antistatic/hair conditioning/skin conditioning	30% pet*	used conc. aq.	-	+	NT
559	Cream				+	NS	NT
563	Lotion			pure	+	++	NT
	Peg-7 hydrogenated castor oil	emulsifier/ surfactant	30% pet*	10% PET	+	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	peg-45/dodecyl glycol copolymer	emulsion stabiliser	5% pet*	2.0% PET	+	+	NT
	benzyl alcohol	preservative/ solvent	5% pet*	1.0% PET	?	+	NT
	polymer/peg-2 hydrogenated castor oil/so	emulsifier	20% pet n.a.	5.00%	-	+	NT
565	Sunscreen			as is*	+	++	NT
	c30-38 olefin/isopropyl maleate/ma copolymer	surfactant, emulsion stabiliser		5% pet	+	+	NT
	benzophenone-3	UV filter	2% pet*	10% pet	++	++	NT
565	Tonic			as is*	-	++	NT
567	Cream				+	NS	NT
569	Shampoo			5% pet*	-	-	NT
	CI 17200	cosmetic colouring agent	1% pet*	1% pet*	-	?	NT
	sodium laureth sulfate	surfactant/ detergent/ foam layer	0.5% aq+	5% aq	+	+	NT
569	Douche and shower gel			5% aq (open test)	-	-	NT
	cocamide mea	emulsifying/emulsion stabilisers/surfactant/ viscosity controlling	0.5% aq	0.5% aq	-	?	NT
587	Shampoo			5% aq (open test)	-	+	NT
	sodium cocoyl glutamate	surfactant/ detergent	1% aq	1% aq	-	+	NT
	sodium coco-sulfate	surfactant/ detergent / emulsifier		1% aq	?	-	NT
596	Cleansing gel				NS	NS	NT
	acrylates/c10-30 alkyl acrylate crosspolymer	film former	1% pet	2% aq	-	+	+

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
602	styrene/acrylates copolymer	opacifying		10% aq	-	+	+
	Gel/cream			5% aq* (open test)	-	+	-
611	coco-betaine	surfactant/ detergent/ foam layer	used conc.	6% aq	-	?	-
	sodium laureth sulfate	surfactant/ detergent/ foam layer	0.5% aq+	2% aq	-	?	?
	Shaving cream			5% aq (open test)*	?	+	NT
	limonene	fragrance	2% pet*	2% pet*	-	?	NT
625	sodium lauryl sulfate	surfactant/ detergent/ foam layer	0.5% aq+	0.1% aq*	?	+	NT
	sodium cetyl sulfate/sodium lauryl sulfate/sodium myristyl sulfate/sodium stearyl sulfate/laureth-10	combination of functions, like emulsifier, surfactant, detergent, foam layer		1% aq	?	+	NT
	Cream			as is*	+	NS	NS
625	Lip cream				-	NS	NS
685	acetylated lanolin	antistatic/emollient/emulsifying	30% pet	30% pet	+	NS	NS
	perfume	deodorant/masking	10% pet	10% pet	+	NS	NS
	Cream			as is*	?	+	NT
687	methylisothiazolinone	preservative	used conc.	0.1% aq	+	++	NT
	Shampoo			5% aq* (open test)	NS	NS	NS
	cocamidopropyl betaine	surfactant/cleansing/	1% aq	1% aq	-	+	+

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
		foam boosting					
711	Sunscreen			as is*	?	+	NT
	tocopherol	antioxidant/ skin conditioner	10% pet*	10% pet*	++	+	NT
713	Cream			as is*	-	-	-
	perfume	deodorant/masking	10% pet	10% pet	-	++	++
	cocamidopropyl betaine	boosting	1% aq	1% aq	-	?	+
713	Shower gel			5% aq* (open test)	-	-	-
	cocamidopropyl betaine	boosting	1% aq	1% aq	-	?	+
715	Body milk			as is*	-	-	NT
	alpha-isomethyl ionone	perfume compound	5% pet*	5% pet*	?	-	NT
735	Soap			1% aq	NS	NS	NT
	tetrasodium edta	chelate	1% pet*	1% aq*	?	-	NT
	perfume	deodorant/masking	10% pet	10% pet*	-	+	NT
	geraniol	fragrance/ tonic	5% pet*	5% pet*	-	+	NT
737	Shampoo			5% aq* (open test)	-	-	NT
	polyquaternium-7	antistatic/ film former	0.1% aq*	1% aq	-	?	-
	linalool	deodorants/perfume compound	10% pet*	10% pet*	?	-	NT
737	Shower gel			5% aq* (open test)	-	-	+
	specific ingredient			5% aq* (open test)	-	?	NT
	polyquaternium-7	antistatic/ film former	0.1% aq*	0.1% aq*	?	-	NT
	perfume	deodorant/masking	10% pet	10% pet*	?	-	NT
785	Styling product			5% aq* (open test)	-	-	NT
	citronellol	masking	2% pet*	2% pet*	+	+	NT
	limonene	fragrance	2% pet*	2% pet*	+	+	NT
789	Cleansing gel (face)			5% aq* (open test)	+	+	NT
	potassium behenate	cleansing/ surfactant		1% aq	-	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	potassium laurate	emulsifying/ surfactant	1% aq	1% aq	-	+	NT
	potassium myristate	emulsifying/ surfactant	1% aq	1% aq	-	+	NT
	potassium palmitate	emulsifying/ surfactant		1% aq	-	+	NT
	sodium methyl cocoyl taurate	surfactant/ cleansing/ foaming	0.5% aq	0.5% aq	+	+	NT
791	Sunscreen			as is*	+	+	NT
791	Sunscreen			as is*	+	+	NT
793	Shampoo			5% aq* (open test)	-	?	?
	cocamidopropyl betaine	boosting	1% aq	1% aq	-	?	+
793	Body milk			as is*	-	-	+
797	Eye pencil				-	-	NT
	ascorbyl palmitate	antioxidant	30% pet*	30% pet*	+	+	NT
811	Body cream			as is*	+	+	NT
	sucrose stearate	emulsifying/skin conditioning	20% pet+	3% aq/alc	+	+	NT
	glyceryl stearate	emollient/ emulsifying	20% pet*	30% pet*	?	+	NT
	sorbitan tristearate	emulsifying	5% m.o.*	5% mo	+	+	NT
	stearic acid	emulsifying/ emulsion stabiliser/ refatting?	5% pet*	5% pet*	-	+	NT
813	Body milk			as is*	-	+	NT
899	Cream			as is*	-	+	+
	cetyl alcohol	emollient/ emulsifying/ opacifying/ viscosity	30% pet*	20% pet	-	?	+

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	perfume	controlling deodorant/masking	10% pet	10% pet*	-	+	+
	peg-20 stearate	emulsifying/ humectant/ surfactant		30% aq/alc	-	-	+
	stearyl alcohol	emollient/ emulsion stabilisers/ opacifying/ viscosity controlling	30% pet*	30% pet*	-	?	+
901	Shampoo			5% aq* (open test)	?	+	NT
	decyl glucoside	surfactant/ emulsion stabilisers	1% aq	1% aq	+	+	NT
	perfume	deodorant/masking	10% pet	10% pet*	+	+	NT
915	Shampoo			5% aq*	?	+	NT
	cocamidopropyl betaine	boosting surfactant/ cleansing/ foaming	1% aq	1% aq*	-	+	NT
	sodium laureth sulfate		0.5% aq+	2% aq*	?	+	NT
915	Soap			5% aq*	-	+	NT
	sodium laureth sulfate (24)	surfactant/cleansing/f oaming	0.5% aq+	0.5% aq	?	+	NT
	sodium laureth sulfate (25)	surfactant/cleansing/f oaming	0.5% aq+	0.1% aq	+	+	NT
949	Shampoo			5% aq* (open test)	-	+	NT
	perfume	deodorant/masking	10% pet	10% pet*	-	+	NT
	sodium benzoate	preservative	5% pet*	5% aq*	-	?	NT
951	Hair conditioner			5% aq	?	+	NT
953	Eye make-up remover			as is*	?	+	NT
	paraffinum liquidum	antistatic/emollient/s olvent/skin?	pure*	as is*	?	+	NT
955	Soap-free washing gel			5% aq (open test)*	-	-	-
	alanine/biotin/glycine/	combination of		0.1% aq	-	+	+

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	leucine/lysine/magnesium asparate/niacinamide/pyridoxine hcl cocamidopropyl betaine/glycol distearate/sodium c14-16 olefin sulfonate/sorbitan laurate/potass. Sor	functions, like antistatic/conditioning		1% aq	-	?	+
	disodium laureth sulfosuccinate	surfactant/foaming/cleansing	2% aq	2% aq	-	?	+
	laureth-2	emulsifying/surfactant/cleansing	10% aq	10% aq	-	-	+
	sodium chloride	viscosity controlling/bulking	0.9% aq*	0.9% aq*	-	-	?
	sodium laureth sulfate	surfactant/cleansing/foaming	0.5% aq+	2% aq	-	?	+
957	Cleansing product			as is	-	+	+
	citrus aurantium oil/citrus grandis oil/citrus nobilis oil/lavandula angustifolia oil/lavandula etc.	combination of functions, like astringent/ tonic/ masking		5% pet	-	+	+
	limonene	fragrance	2% pet*	2% pet*	-	?	+
959	Cream			as is*	-	+	++
	geraniol	fragrance/ tonic	5% pet*	5% pet*	-	+	+
	limonene	fragrance	2% pet*	2% pet*	-	+	+
	perfume	deodorant/masking	10% pet	10% pet*	-	?	+
961	Eye contour cream			as is*	-	+	+
	methylisothiazolinone	preservative	used conc.	0.05% aq	-	+	+

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
963	Cream			as is*	-	-	+
	capryloyl salicylic acid	skin conditioning		1% alc	-	-	+
	paraffinum liquidum/cera microcristallina/paraffin	combination of functions, like antistatic/ emollient/ solvent/ skin?/ binding/ emulsion stabilisers/ opacifying/ viscosity controlling	pure*	pure	-	?	+
	sorbitan tristearate	emulsifying	5% m.o.*	5% mo*	-	-	+
	tocopherol	antioxidant/ skin conditioning	10% pet*	10% pet*	-	?	+
971	Make-up remover			as is*	-	+	NT
973	Sun allergy protection			as is*	-	-	NT
	bis-ethylhexyloxyphenol methoxyphenol triazine	UV absorbers/UV filter		2% pet	+	++	NT
	butyl methoxydibenzoylmethane	UV absorbers/UV filter	2% pet*	10% pet*	+	+	NT
	octocrylene	UV absorbers/UV filter	1% pet*	10% pet*	-	++	NT
973	Sun protection lotion			as is*	-	-	NT
	octocrylene	UV absorbers/UV filter	1% pet*	1% pet*	+	+	NT
	bis-ethylhexyloxyphenol methoxyphenol triazine	UV absorbers/UV filter		3% pet	+	+	NT
	butyl methoxydibenzoylmethane	UV absorbers/UV filter	2% pet*	2% pet	+	+	NT
	drometrisole trisiloxane	UV absorber		0.05% pet	-	+	NT
	peg-30 dipolyhydroxystearate	emulsifying	30% pet+	2% pet	-	+	NT



Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	tocopherol	antioxidant/ skin conditioning	10% pet*	10% pet*	-	+	NT
993	Body milk			as is*	?	+	NT
	cetearyl alcohol/cetearyl glucoside	emollient/emulsifying /emulsion stabilisers/opacifying /viscosity controlling	20% pet*	20% pet	-	+	NT
995	Shampoo			5% aq* (open test)	-	?	+
	potassium sorbate	preservative	5% pet*	5% pet*	-	?	NT
	sodium benzoate	preservative	5% pet*	5% pet*	-	?	?
997	Make-up remover			pure	-	+	-
1001	Douche and shower gel			5% aq* (open test)	+	+	NT
1001	Shampoo			5% aq* (open test)	-	+	NT
	disodium lauroamphodiacetate/sodium chloride	combination of functions, like antistatic/ surfactant/ viscosity controlling	1% aq*	1% aq	+	+	NT
	piroctone olamine	preservative	1% pet	1% pet	-	+	NT
1005	Cleansing gel			as is	?	+	NT
	sodium laureth sulfate	surfactant/cleansing/foaming	0.5% aq+	2% aq*	-	+	NT
1041	After sun product			as is*	-	-	NT
	perfume	deodorant/masking	10% pet	10% pet*	?	?	NT
1045	Body milk			as is*	+	+	NT
	citronellol	masking perfume compound/ masking	2% pet*	2% pet*	+	+	NT
	hydroxycitronellal		2% pet*	2% pet*	+	+	NT
1045	Douche gel			5% aq*(open test)	?	+	NT
	linalool	deodorants/ perfume compound	10% pet*	10% pet*	+	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
1047	Deodorant			as is*	?	-	NT
	dimethiconol/cyclopentasiloxane	antifoaming/emollient/moisturising/ hair conditioning/ solvent	5% pet / pure	5% pet	?	-	NT
1049	Shampoo			5% aq*(open test)	-	?	NT
	benzyl salicylate	U.V. absorbers	2% pet*	2% pet*	?	-	NT
	glycol distearate	emollient/emulsifying /opacifying/viscosity controlling	50% mo*	50% mo*	+	+	NT
	sodium laureth sulfate	surfactant/cleansing/foaming	0.5% aq+	2% aq*	-	?	NT
1049	Cream			as is*	-	-	NT
	hexyldecanol/hexyl laurate (1:1)	humectant/solvent/skin in conditioning/ emollient/ viscosity controlling	30 % pet*	30% pet	-	?	NT
	tocopherol/helianthus annuus seed oil (7:3)	antioxidant/skin conditioning/ emollient/masking	10% pet*/ 30% pet	15% pet	-	?	NT
1053	Shampoo			5% aq*(open test)/ 1% aq	? / -	+ / +	NT
	carbomer	emulsion stabilisers/viscosity controlling	10% aq	10% aq/alc	-	+	NT
	diaminopyrimidine oxide	hair conditioning/skin conditioning	-	0.01% aq/alc	?	-	NT
	panthenol	antistatic/hair conditioning/skin	30% pet*	5% aq/alc	-	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
		conditioning					
1089	sodium laureth sulfate Sunscreen	surfactant/cleansing/f oaming	0.5% aq+	1% aq as is*	- -	+ +	NT ++
1091	octocrylene Cream	UV absorbers/UV filter	1% pet*	10% pet* as is*	- -	+ +	+ +
1095	diazolidinyl urea perfume Cream	preservative deodorant/masking	2% pet* 10% pet	2% pet* 1% alc as is*	- - -	+ + +	+ + NT
1097	Sunscreen			as is*	-	+	NT
1107	Shampoo			5% aq* (open test)	-	?	+
1109	cocamidopropyl betaine cocamidopropyl betaine sodium benzoate Cream	boosting boosting preservative	1% aq 1% aq 5% pet*	1% aq* 1% pet 0.2% aq	- - -	? - -	+ ? ?
1111	phenoxyethanol Douche gel	preservative	1% pet*	1% pet 5% aq(open test)*	- -	- +	+ NT
	cocamidopropyl betaine	surfactant/cleansing/f oam boosting	1% aq	1% aq*	?	+	NT
1111	sodium laureth sulfate Bath and shower gel	surfactant/cleansing/f oaming	0.5% aq+	2% aq* 5% aq (open test)*	- -	+ +	NT NT
	cocoamidopropyl betaine	surfactant/cleansing/f oam boosting	1% aq	1% aq*	?	+	NT
	coco-glucoside	surfactant/foaming	5% pet or 5% aq+	5% pet	-	?	NT
	disodium laureth	surfactant/foaming/cl	2% aq	2% aq	-	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	sulfosuccinate	eansing					
	sodium laureth sulfate	surfactant/cleansing/f oaming	0.5% aq+	2% aq*	-	+	NT
1113	Eye make-up remover			as is*	-	?	NT
1117	Shampoo			5% aq* (open test)	-	-	+
	Cocamidopropyl betaine/sodium chloride	combination of functions, like surfactant/cleansing/f oam boosting/ viscosity controlling/bulking		2% aq	-	?	+
1121	Sunscreen			5% aq* (open test)	+	++	+
	acrylates/c10-30 alkyl acrylate crosspolymer	film formers	1% pet	1% 50/50 alc/aq	-	?	+
	octocrylene	UV absorbers/UV filter	1% pet*	1% pet	-	+	+
1199	Shampoo				-	+	NT
	butylphenyl methylpropional	masking	1% pet*	1% pet	-	-	+
	citronellol	masking	2% pet*	2% pet	-	?	?
1201	Deodorant				-	-	NT
	limonene	perfume compound	2% pet*	2% pet	-	?	NT
	mentha arvensis piperascens herb oil	refreshing/masking/b otanicals/ tonic/deodorant	2% pet*	2% pet	-	?	NT
	polyglyceryl-10 laurate	emulsifying	-	5% pet	-	?	NT
	potassium sorbate	preservative	5% pet*	5% pet	?	?	NT
1205	Eye shadow				-	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	butylparaben/ ethylparaben/isobutylparaben/methylparaben/propylparaben/phenoxyethanol	preservative		1.5% 50/50	-	?	+
1213	Shampoo				-	?	NT
	nymphaea coerulea flower extract + propyleneglycol + aqua	humectant/solvent/skin conditioning		5% aq	-	?	NT
	sodium laureth sulphate	surfactant/cleansing/foaming	0.5% aq+	0.5% aq	-	?	NT
1213	Mascara				-	-	NT
	acrylates copolymer	antistatic/binding/film formers	1% pet	1% pet	-	?	NT
	calcium aluminum borosilicate	bulking		5% pet	-	+	NT
	disodium edta	chelating/viscosity controlling	1% pet*	1% pet	?	+	NT
	vp/eicosene copolymer	antistatic/binding/film formers/viscosity controlling	10% pet*	10% pet	?	+	NT
1213	Cream				-	-	NT
	disodium edta	chelating/viscosity controlling	1% pet*	1% aq	?	+	NT
	potassium cetyl phosphate	surfactant	5% aq	1% pet	-	?	NT
	tin oxide + mica + ci 77491 + ci 77891	combination of functions, like opacifying/viscosity controlling/ cosmetic		2% pet	+	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
		colorants					
1213	Hand cream			UN	-	-	NT
	dimethicone	antifoaming/emollient	10% pet*	10% pet	?	+	NT
	limonene	perfume compound	2% pet*	2% pet	-	+	NT
	chlorinated water			pure	+	+	NT
1261	Cream			pure	-	-	NT
	capryloyl salicylic acid	skin conditioning		1% alc	-	?	NT
1279	Sunscreen				+	NS	NS
	butyl methoxydibenzoylmethane	U.V. absorbers/UV filter	2% pet*	10% pet	-	+	++
	homosalate	U.V. absorbers/uv filter/skin conditioning	2% pet*	5% pet	-	+	+
	octocrylene	UV absorbers/UV filter	1% pet*	10% pet	-	+	?
	tocopheryl acetate	antioxidant	10% pet*	10% pet	-	?	+
1313	Lip cream				+	NS	NS
	menthoxypropanediol	refreshing/masking		5% pet	+	+	NT
1317	Deodorant				+	NS	NT
	butylphenyl methylpropional	masking	1% pet*	1% pet	?	+	NT
	octyldodecanol	emollient/solvent	20% pet*	10% pet	?	+	NT
	perfume	deodorant/masking	10% pet	5% alc	+	++	+
	phenoxyethanol	preservative	1% pet*	1% pet	-	+	NT
1317	Deodorant				+	NS	NT
	benzyl alcohol	preservative/solvent	5% pet*	5% pet	-	?	NT
	citronellol	masking	2% pet*	2% pet	-	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	corn starch modified/fragrance (1)			10% pet	?	+	+
	perfume	deodorant/masking	10% pet	10% pet	+	++	+
	corn starch modified/fragrance (2)			10% pet	?	+	+
1317	Styling product			pure	-	-	NT
	butylphenyl methylpropional	masking	1% pet*	10% pet	-	+	NT
	hydroxypropyl guar	antistatic/binding/emulsion stabilisers/film formers/viscosity controlling	20% pet*	20% alc/aq 50/50	-	?	NT
1339	Cream			pure	-	-	NT
	butyl methoxydibenzoylmethane	U.V. absorbers/UV filter	2% pet*	2% pet	-	+	NT
	octocrylene	UV absorbers/UV filter	1% pet*	1% pet	-	+	NT
	perfume 2	deodorant/masking	10% pet	10% pet	-	?	NT
	perfume 1	deodorant/masking	10% pet	10% pet	-	+	NT
1339	Cream				-	+	NT
	laurus nobilis oil	refreshing/tonic/masking		4% pet	+	++	NT
	simmondsia chinensis oil	emollient	20% pet*	pure	-	+	NT
1365	Sunscreen				+	+	NT
	methylene bis-benzotriazolyl tetramethylbutylphenol/decyl glucoside/propylene glycol/xanthan gum/aq	combination of functions, like UV absorber/UV filter/surfactant/emul		14% aq	+	+	NT

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
		sion stabilising/viscosity controlling					
1365	Sunscreen			as is**	+	+	NT
1383	After sun			as is	+	+	NT
	specific ingredient			as is	++	++	NT
1389	Eye contour cream			as is**	-	-	NT
	cera alba	emollient/emulsifying /film formers	30% pet*	30% pet**	-	?	NT
	cyclohexasiloxane	hair conditioning/emollient/ t/solvent		10% pet	+	+	NT
	hydroxypropyl tetrahydropyrantriol			30% 50/50 alc/aq	+	+	NT
	phenoxyethanol	preservative	1% pet*	1% 50/50 alc/aq	?	+	NT
1389	Make-up			as is**	-	-	NT
	CI 77491, disodium stearoyl glutamate, aluminum hydroxide	combination of functions, like hair conditioning/skin conditioning/ cosmetic colorants/ emollient/humectant/ viscosity controlling		2% pet	-	?	NT
1397	Cleansing gel			as is	-	+	NT
	sodium laureth sulfate	surfactant/cleansing/f oaming	0.5% aq+	1.8% aq**	-	+	NT
1443	Sunscreen			as is	-	+	NT
	butyrospermum parkii	skin	30% mo	10% pet	-	+	NT



Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	butter	conditioning/emollient					
	C12-15 alkyl benzoate	emollient	30% pet	20% pet	-	+	NT
	C30-38 olefin/isopropyl maleate/ma copolymer			5% pet	-	+	NT
	dimethicone	antifoaming/emollient	10% pet*	5% pet	-	+	NT
	octocrylene	UV absorbers/UV filter	1% pet*	10% pet	-	+	NT
1485	Cream			as is**	-	?	+
	capryloyl salicylic acid	skin conditioning		1% alc	-	+	+
1485	Cream			as is**	-	+	+
	capryloyl salicylic acid	skin conditioning		1% alc	-	+	+
1487	Cream				+	++	NT
	glyceryl caprate	emollient	1% pet	10% pet	-	+	NT
	polyglyceryl-2 dipolyhydroxystearate	skin conditioning		20% pet	-	+	NT
	polyglyceryl-4 isostearate	emulsifying		20% pet	-	+	NT
1537	Sunscreen			as is	+	NS	NT
	terephthalylidene dicamphor sulfonic acid	UV absorbers/UV filter	1% pet	1% aq	+	NS	NT
	titanium dioxide + silica + aluminum hydroxide + alginic acid	combination of functions, like opacifying/UV absorber/emollient/humectant/viscosity controlling		pure	+	NS	NT
1567	Cream				NS	NS	NS

Patient number	Tested product or ingredient	Substance type	Reference concentration	Test concentration	Outcome 1 <sup>st</sup> measurement	Outcome 2 <sup>nd</sup> measurement	Outcome 3 <sup>rd</sup> measurement
	methyl glucose sesquistearate	emollient/emulsifying /skin conditioning	20% pet+	5% pet	-	++	NT
	peg-20 methyl glucose sesquistearate	emulsifying	20% pet	5% pet	-	++	NT
1607	Make-up				NS	NS	NS
	acetyl tributyl citrate/ butyl acetate/ ethyl acetate/ isopropyl alcohol/ nitrocellulose	combination of functions, like film formers/plasticizer/solvent antifoaming/ viscosity controlling		20% pet	+	++	NT



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