

# **Inventory of consumer products containing nanomaterials**

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This investigation has been performed by order and for the account of the Food and Consumer Product Safety Authority (VWA), within the framework of project V340120 (Health Risks of the application of nanotechnology in consumer products).

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# 1. Introduction

Nanotechnology is a promising technology which enables the development and application of many different types of products. Nanomaterials are developed and used because they have specific physico-chemical properties, such as improved electromagnetic properties, catalytic properties, pharmacokinetic and targeting properties, strength, stiffness, stability, etc. Although different terms and definitions are used in the scientific literature, in this report the term nanomaterials is used to indicate engineered materials which contain structures with a size of less than 100 nm in at least one dimension. These materials include free nanoparticles as well as nanomaterials that are attached to or incorporated into the matrix of larger structures. Naturally occurring and unintentionally produced nanomaterials are not included in this definition.

Important areas of application for nanomaterials are electronics, pharmaceuticals and foods. This report focuses on the use of nanomaterials in consumer products (non-food products intended for the consumer). Although several consumer products containing nanomaterials are already available on the Dutch market, there is still a lack of knowledge about the potential health risks of nanomaterials. However, it can not be excluded that the specific physico-chemical properties which make nanomaterials so interesting may also lead to specific risks. For instance, smaller particles have a greater surface area per unit mass than larger particles, which may render them more reactive. This may result in an increased reactivity with biological systems which may lead to an increased toxicity. In addition, there are indications that the small particle size may allow nanomaterials to travel more easily through the body compared to large particles. It is generally assumed that the most important health risks of nanomaterials are to be expected from free nanoparticles. For nanomaterials that are attached to or integrated into larger materials or structures, like for example coatings, the health risks are considered minimal, as long as the nanomaterials remain in the matrix or bound to the surface of the larger material, and therefore are not available for exposure.

Within RIVM project V340120 (Health Risks of the application of nanotechnology in consumer products) one of the additional knowledge questions of 2006 posed by the Food and Consumer Product Safety Authority (VWA) was: “9.1.6a Start with an inventory of possible exposure of consumers to products which are manufactured with nanotechnology or which contain nanoparticles”.

There are no specific regulations concerning the authorization of products containing nanomaterials. However from an inventory of consumer products containing nanomaterials in the US, it is known that at least 475 consumer products which claim to have used nanotechnology are available on the US market (Woodrow Wilson International Centre for Scholars, 2007). To estimate the possible exposure of Dutch consumers you need to know which type of products in which nanotechnology is used are or will become available on the

Dutch market. For this purpose an inventory of consumer products containing nanomaterials in the Netherlands is being made. The available products and the description of these products may give an indication of the potential exposure of consumers to nanomaterials from the use of nanotechnology in consumer products.

## 2. Methods

For the inventory information was obtained from different sources. In Table 2.1 it is listed which information was obtained from which data source.

**Table 2.1: Information obtained from different data sources**

	<b>Data source</b>	<b>Information about</b>
a	Internet sites of Dutch manufacturers	Manufacturers and distributors Available products and their application Products under development
b	Woodrow Wilson International Centre for Scholars database of consumer products	Manufacturers Available products and their application
c	Nanoshop database	Manufacturers Available products and their application
c	Information from manufacturers present at Nanosolutions in Köln	Manufacturers Available products and their application
d	Internet sites of foreign manufacturers	Additional information to b and c Products under development
e	Contact with Dutch manufacturers	Additional information to a

From the databases (b and c), only products from EU manufacturers or well known multi-nationals were selected, since it was expected that products from these multinationals are also available on the Dutch market. The available information on each product was put into an excel file. A more specific description of each column in this file is given in Table 2.2.

**Table 2.2: More specific description of the information obtained for each consumer product**

<b>General information</b>	
Product nr.	our numbering of the products
Name of product	the name given by the manufacturer/distributor
<b>Information about the manufacturers and distributors</b>	
Name of manufacturer	the name of the manufacturer
Country of manufacturing	the abbreviation of the country of the manufacturer
Country of distributors	the abbreviations of the countries of the distributors
Order via internet	possibility to order via internet (yes or no)
<b>Information about type of product</b>	
Type product	category as in Woodrow Wilson International Centre for Scholars database
Subtype product	subcategory (see Table 2.3)
<b>Information about the nanoparticles</b>	
Matrix nanoparticles	fluid, solid, powder, coating, gas, etc.
Chemical composition	gold, silver, TiO <sub>2</sub> , etc.
<b>Reference</b>	
Source	database (e.g. Woodrow Wilson International Centre for Scholars, Nanoshop) or internet search
Website product	the website of the product

The different products were categorized into several product categories and subcategories, similar to the categories used in the Woodrow Wilson International Centre for Scholars database (see Table 4.1).

### 3. Limitations

It was not possible to obtain a complete overview of all consumer products containing nanomaterials that are available on the Dutch market, since:

- a) there are products with the claim “nano” on the market that do not contain nanomaterials and have not been produced with nanotechnology either
- b) not all producers advertise their products as such and there is (at present) no legal obligation to inform consumers or label products that contain nanomaterials
- c) the amount of available products containing nanomaterials is large and fast growing
- d) it is difficult to find out in which countries or parts of the world the products are available

Add a) an example of a false “nano” claim is the ‘Magic Nano’ spray. This protective glass and bathroom sealant that was recalled in late March 2006 in Germany after causing severe breathing problems for some consumers, did not contain any nanoparticles (Small Times, 2006). Although no other examples of products with a false “nano claim” were encountered yet, it cannot be excluded that this inventory includes such products, since it was not confirmed if these products actually do contain nanomaterials.

Add b) in the UK, the Voluntary reporting scheme (VRS) for manufactured Nanomaterials was launched on 22nd September 2006. An update on the scheme’s progress during its first 9 months, reported a total of 9 VRS submissions. The Advisory Committee for Hazardous substances (ACHS) felt that the current low level of response to the scheme, and the variable quality and relevance of data submitted was due, in part at least, to shortcomings in the scheme guidance, particularly in defining how the data submitted will be used and what data might be relevant. The Committee has recommended some changes to aid clarity in both the data reporting form and VRS literature. These recommendations will be taken forward by Defra (DEFRA, 2007).

Add c) as of May 2007, the Woodrow Wilson nanotechnology consumer products inventory has grown by 124% (from 212 to 475 products) since it was released in March 2006 (Woodrow Wilson International Centre for Scholars, 2007).

Add d) although it is not always clear whether a product is available on the Dutch market, it could be assumed that via Internet there is almost a world-wide availability of all kinds of consumer products.

Therefore, the excel file listing the different consumer products probably does not contain all the available products within each category and only includes consumer products which are expected to contain nanomaterials based on the information from one of the databases or internet sites. Since it was not confirmed if the products actually do contain nanomaterials, some of these products may not contain nanomaterials.

## 4. Results

In total 143 consumer products containing nanomaterials were identified. Most of these products belong to the category “Home furnishing & household products”. The subcategories “Cleaning products” and “Coatings” contained many consumer products. The number of products within each product category and subcategory can be found in Table 4.1. Surprisingly, only two products were identified within the subcategory “Sun cosmetics”. Since the use of nano-scaled titanium dioxide and zinc oxide in sun cosmetics is one of the first and well known applications of nanomaterials in consumer products, this subcategory was expected to contain a relatively large amount of products. One of the reasons for this discrepancy may be that many sun cosmetics containing nanomaterials are probably not advertised as such (anymore). Another reason may be that there are not as many sun cosmetics containing nanomaterials on the market anymore. Since, the most important reason for the relatively small amount of products identified within the subcategory “Sun cosmetics” is unknown, it is impossible to estimate the actual amount of nanomaterial-containing sun cosmetics available. The classification of the products into the different categories was difficult. Although many products may belong to more than one category, each product was assigned to one product category to avoid counting one product twice.

**Table 4.1: Number of products per product category\* and per subcategory**

Type of product	Nr.	Subtype of product	Nr.
Appliances	5	Large Kitchen appliances (refrigerators)	2
		Laundry and clothing care (washing machines)	3
		Air Filtration and purification	
		Air Conditioning	
		Air/water Sanitizers/Neutralisers	
		Batteries	
Electronics & computers	7	Audio	1
		Cameras and film	1
		Computer hardware	2
		Display	1
		Mobile devices and communications	
		Television	
		Video	
		Memory	2
Home furnishing & household products	42	Cleaning products	21
		Cooking utensils (cutting board)	3
		Furnishing (pillows, etc.)	
		Luxury (jewellery, etc.)	
		Construction materials	10
		Paint	8
Motor vehicles	13	Exterior (coating/paint, tyres)	12



Type of product	Nr.	Subtype of product	Nr.
		Maintenance and accessories (wax/air purification)	1
Food Packaging	1	Food packaging	1
		Sensors in food packages	
Personal care products & cosmetics	15	Sun cosmetics	2
		Baby care products	
		Hair care (shampoo, gel, hair dyes, etc.)	
		Skin care (shower gel, creams, deodorant, foot care, shaving soap, etc)	12
		Oral hygiene (toothpaste, mouth wash)	1
		Make-up and nail care (lipstick, eye shadow, etc.)	
Health	6	Wound dressing	4
		Hearing aids	
		Other health products	2
Sporting goods	10	Rackets, bats, golf clubs, etc.	10
Textile	15	Clothing	12
		Other textiles (sheets, etc.)	3
Toys & games		Toys	
		Games	
Cross-cutting (multi-functional)	28	Coatings (anti-fog, self-cleaning, etc.)	28
Miscellaneous	1	Miscellaneous	1

\* Categories were modified from the database of the Woodrow Wilson International Centre for Scholars

Information on the manufacturers and/or distributors of the products was not easily found for many products. However, based on searches at various websites, it seems that most of the products are manufactured outside the Netherlands, but have distributors within the Netherlands and many other European countries. In addition, several products without a Dutch manufacturer or distributor can be ordered via an internet sites. Therefore most of the products (approximately 120) are expected to be available on the Dutch market.

**Table 4.2: Number of products available on the Dutch market**

Description	Nr	%
Products from Dutch manufacturers	11	8
Products with Dutch distributors	114	80
Products without a Dutch manufacturer/distributor that can be ordered via internet	6	4
Products available on the Dutch market	120	84

From the description of the products on the websites or within the databases, it is not always clear which nanomaterials are used and how they are incorporated into the products. Based on the descriptions of the product, the way the nanomaterials were incorporated into the product was inferred. Most of the products are liquids, sometimes contained within spray can or in a bottle with a spray head. An overview of the different ways nanomaterials are incorporated into the consumer products can be found in Table 4.3.

**Table 4.3: Matrix used in consumer products containing nanomaterials.**

<b>Description</b>	<b>Nr</b>	<b>%</b>
<b>Matrix nanoparticles</b>		
liquids (fluids, sprays and moisturised tissues)	78	55
creams and pastes	13	9
solids, coatings and textiles	50	35
powder	1	1
gass		

Only for a few products, information on the chemical composition of the nanomaterials was obtained. An overview of the nanomaterials used within products from our inventory as well as the Woodrow Wilson International Centre for Scholars database is given in Table 4.4.

**Table 4.4: Chemical composition of nanomaterials in the consumer products**

<b>Description</b>	<b>Our inventory</b>		<b>Woodrow Wilson*</b>	
	<b>Nr</b>	<b>%</b>	<b>Nr</b>	<b>%</b>
<b>Chemical composition</b>				
silver	11	7	47	13
carbon (carbon nanotubes, carbon fibres)	6	4	40	11
silica	6	4	18	5
titanium and titanium dioxide	1	1	13	4
polymers	1	1		
calcium phosphate	1	1		
zinc oxide			17	5
cerium oxide			1	0

\* Woodrow Wilson International Centre for Scholars Analysis November 26, 2006, containing 356 products

## 5. Conclusions

Within this project 143 consumer products which are a) expected to contain nanomaterials and b) probably available at the Dutch market, were identified. However, it was not confirmed if these products actually do contain nanomaterials. The list of identified products probably does not contain all the available products, since there is no legal obligation to inform consumers or label products that contain nanomaterials.

Most of the 143 identified consumer products containing nanomaterials belong to the category “Home furnishing & household products”. The subcategories “Cleaning products” and “Coatings” contained many consumer products. Most of the identified products (approximately 120) are expected to be available on the Dutch market.

With respect to exposure, it is important to know if the nanomaterial is incorporated into larger materials (which is the case for most solid applications) or if the material consists of nanoparticles to be released in the air (as aerosols) or present in a liquid form (in an emulsion or suspension). The potential exposure is expected to be much higher for this last two groups of nanomaterials (nanoparticles). Therefore the potential exposure of consumers using products containing liquids, creams, pastes and powders or available in spray application is expected to be relatively high compared to solid products. However, if the nanomaterials are not integrated into the matrix of larger materials, relatively high exposures may also be possible during the use of solids, coatings or textiles. Inhalatory exposure is most likely to occur with sprays and powders. Dermal exposure is most likely to occur with liquids, creams, pastes, textiles and powders, especially skin care products. Oral exposure strongly depends on the type of application, but is unlikely for most consumer products (except for products like toothpastes). Since most consumer products (e.g. fluids, sprays and moisturised tissues) contain liquids, the potential inhalatory and dermal exposure of consumers during the use of most of the consumer products may be relatively high. It should be noted, however, that this potential exposure only indicates external exposure, which does not take into account if the nanomaterials are taken up by the body.

The available information on the nanomaterials used within products from our inventory as well as the Woodrow Wilson International Centre for Scholars database indicates that silver, carbon and silica are the most widely used nanomaterials within consumer products. However, since information about the chemical composition of nanoparticles was only obtained for a few products, no firm conclusion with respect to most widely used nanomaterials in consumer products can be made.

## 6. References

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- Small Times (2006) Study shows no nano in Magic Nano, the German product recalled for causing breathing problems. Available at: [http://www.smalltimes.com/Articles/Article\\_Display.cfm?ARTICLE\\_ID=270664&p=109](http://www.smalltimes.com/Articles/Article_Display.cfm?ARTICLE_ID=270664&p=109) [Last accessed July 2007].
- Woodrow Wilson International Centre for Scholars (2006) Analysis of The Nanotechnology Consumer Inventory of November 26, 2006. Available at: <http://www.nanotechproject.org/44> [Last accessed April 2007]
- Woodrow Wilson International Centre for Scholars (2007) The Nanotechnology Consumer Inventory of the Woodrow Wilson International Centre for Scholars. Available at: <http://www.nanotechproject.org/44> [Last accessed July 2007]

## Annex I Excel file of consumer products containing nanomaterials

Product no.	Name of product	Name of manufacturer	Country of manufacturing (abbreviation)	Country of distributors (abbreviation)	Order via internet (yes/no)	Type product (category as in Woodrow Wilson)	Subtype product	Matrix nanoparticles (fluid, solid, powder, coating, gass, etc.)	Chemical composition (gold, silver, TiO <sub>2</sub> , etc.)	Source	Website product
1	Daewoo Refrigerator	Daewoo (Germany)	Korea	NL, other EU countries	yes	Appliances	App-Large appliances (refrigerators, vacuum	solid	silver	Woodrow Wilson	www.daewoo-electronics.de
2	Daewoo Vacuum Cleaner	Daewoo (UK)	Korea	NL, other EU countries	yes	Appliances	App-Large appliances (refrigerators, vacuum	solid	silver	Woodrow Wilson	www.daewoo-electronics.co.uk
3	Daewoo Nano Silver wasmaschine	Daewoo Electronics Europe GmbH	Korea	NL, other EU countries	yes	Appliances	App-Laundry and clothing care (washing machines)	solid	silver	Woodrow Wilson	www.daewoo-electronics.de
4	Samsung Wasmachine	Samsung	Korea	NL, other EU countries	yes	Appliances	App-Laundry and clothing care (washing machines)	solid	silver	Woodrow Wilson	www.samsung.com
5	Shampoo	ROREHA	DU	NL, other EU countries	yes	Appliances	Care-Oral hygiene (toothpaste, mouth wash)	coating	calcium	nanoschool	http://www.e-c-a.de/
6	Thermed S.O.S. Sensitive Toothpaste with 7FX Diamond® Razor	Henkel KGaA	DU	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	paste	calcium	Woodrow Wilson	www.henkel.nl
7	FOREX® Cosmetics	Wilkinson Sword Ltd.	UK	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	solid	silica	Woodrow Wilson	www.wilkinson-sword.co.uk
8	GlobalMed Technologies	GlobalMed Technologies	UK	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	solid	silica	Woodrow Wilson	www.globalmed-technologies.net
9	Lancome® Rénergie® Flûsh Lifting	Lancome	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	silica	Woodrow Wilson	www.lancome-usa.com
10	Lancome® Rénergie® Microlift	Lancome	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	silica	Woodrow Wilson	www.lancome-usa.com
11	Lancome® Rénergie® Microlift Eye	Lancome	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	silica	Woodrow Wilson	www.lancome-usa.com
12	Nano-Silver hand sanitizer	FinelPolymer, Inc.	Korea	DU, SI, IT	no	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	fluid / gel	silver	Nanoschools	www.wellnet.de
13	Oriscol IV absorbent	Oxiodia	UK	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	nanoschool	http://www.oxiodia.com
14	HYDRAZEN® CREAM	Lancome	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	www.lancome-usa.com
15	Revital Lift® Double Lifting	L'Oréal	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	www.lorealparis-usa.com
16	Revital Lift® Intense Lift Treatment Mask	L'Oréal	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream/fluid	?	Woodrow Wilson	http://www.lorealparis.com
17	Calmig emulsion	Chanel	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	http://www.chanel.com
18	HYDRA FLASH® BRONZER Daily Face	Lancome	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	http://shop.parislor.com
19	Coco Mademoiselle Fresh Moisture Mist	Chanel	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	www.parislor.com
20	Dior Snow Pure UV Base SPF 50	Dior	FR	NL, other EU countries	yes	Personal care products & cosmetics	Care-Skin care (shower gel, creams, deodorant, fo	cream	?	Woodrow Wilson	http://shop.parislor.com
21	Nano Glas en Ceramiek	ProWIN	NI	NL, BE	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.prowin-info.net
22	Nano Stone	ProWIN	NI	NL, BE	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.prowin-info.net
23	Nano Textiel	ProWIN	NI	NL, BE	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.prowin-info.net
24	Nano-Holz-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
25	Nano-Kunststoff-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
26	Nano-Marmor-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
27	Nano-Metall-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
28	Nano-Stein-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
29	X-clean EC	Nano-X	DU	?	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.nano-x.de/index.htm
30	X-view PK	Nano-X	DU	?	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.nano-x.de/index.htm
31	X-clean AO	Nano-X	DU	?	no	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.nano-x.de/index.htm
32	Nano-Glas-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
33	Nano-Textil-Leider-Protector	De Cie GmbH (Nanotechology)	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Nanoschools	www.decie.de/nano2010/index.htm
34	NanoMetal Primer/Reiniger & Versiegelung	NanoMetal Handelsgesellschaft	DU	CH, DK, AT	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid	polymers	Nanoschools	www.nano01.de/
35	Antistat	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	coating	?	nanoschool	http://www.tv.com
36	Antistat	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	coating	?	nanoschool	http://www.tv.com
37	Antistat	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	coating	?	nanoschool	http://www.tv.com
38	Glasses Protection 3 Pkts	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.rtd-services.com
39	Nano glass & stainless coating	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.rtd-services.com
40	Nano Glas & stainless SR	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.rtd-services.com
41	Nano Plastics Sealant	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.rtd-services.com
42	Nanotechnology Chrome & Stainless Steel	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	www.rtd-services.com
43	Nanotechnology Multi Foams	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	http://de.servis.com
44	Nanotechnology Multi Foams	Antistat	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	fluid/spray	?	Internet search	http://de.servis.com
45	Holmenkol Lubes "n Spindel"	HOLMENKOL Sport	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	grain	?	Internet search	www.rtd-services.com
46	Holmenkol Seal "n Glatte"	HOLMENKOL Sport	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	grain	?	Internet search	www.rtd-services.com
47	PowerPreparations-care	HOLMENKOL Sport	DU	NL, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Coatings (anti-fog, self-cleaning, etc.)	grain	?	Woodrow Wilson	http://www.bolnord.nl

Product no.	Name of product	Name of manufacturer	Country of manufacturing	Country of distributors (abbreviation)	Order via Internet (yes/no)	Type product (category as in Woodrow Wilson)	Subtype product	Matrix nanoparticles (fluid, solid, powder, coating, gas, etc.)	Chemical composition (gold, silver, TiO <sub>2</sub> , etc.)	Source	Website product
48	Nano Anti-Beslag	Kleinmann	DU	NI, other EU countries	yes	Cross-cutting (multi-functional)	Cross-Cutting (anti-fog, self-cleaning, etc.)	liquid		Woodrow Wilson	www.kleinmann.net
49	Creative Zen Nano Plus	Creative	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		Internet search	www.creative.com
50	Noxx the next generation ruger	Noxx	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	www.nanobip.com
51	CPU (central processing unit) of every	Many	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	
52	Hard disk drives of all computers	Many	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	
53	LED light emitting diode based consumer	Many	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	
54	Electrically programmable Fuse (eFuse), an	Cavendish Kinetics	NI	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	www.cavendish-kinetics.com
55	Flash memory based consumer products	Many & Doughty	UK	NI, other EU countries	yes	Electronics & computers	Electronics & computers	solid		nanoshop	http://www.doughty.co.uk
56	Reputable Cooling Foam Spray	Bayer Consumer Care Ltd.	UK	NI, other EU countries	yes	Health	Health	solid		Internet search	http://www.droptest.nl
57	Antimicrobial barrierCompres	Smith & Nephew	UK	NI, other EU countries	no	Health	Health	solid		Internet search	http://www.smith-nephew.com
58	Acticoat® antimicrobial barrierCompres	Smith & Nephew	UK	NI, other EU countries	no	Health	Health	solid		Internet search	http://www.smith-nephew.com
59	Acticoat® Absorbent silvergecoat	Smith & Nephew	UK	NI, other EU countries	no	Health	Health	solid		Internet search	http://www.smith-nephew.com
60	Acticoat® antimicrobial barrierCompres	Smith & Nephew	UK	NI, other EU countries	no	Health	Health	solid		Internet search	http://www.smith-nephew.com
61	Acticoat® Moisture Control antimicrobial	Smith & Nephew	UK	NI, other EU countries	no	Health	Health	solid		Internet search	http://www.smith-nephew.com
62	AAABSOLUT NANOBLAU, nicht	AAABSOLUT NANO	CH	?	yes	Home furnishing & household products	Home-Cleaning products	fluid		Nanosolutions	www.aabsolut.ch/
63	AAABSOLUT NANO ROT, saugende	AAABSOLUT NANO	CH	?	yes	Home furnishing & household products	Home-Cleaning products	fluid		Nanosolutions	www.aabsolut.ch/
64	Nano Koelkast Antibac	ProWIN	NL	NI, BE	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.prowin-info.net
65	Nano precision	ProWIN	NL	NI, BE	no	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.prowin-info.net
66	Nano Schimmelkiler	ProWIN	NL	NI, BE	no	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.prowin-info.net
67	Nano-Glasettinger	De Cie GmbH (Nanotechnology)	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Nanosolutions	www.de-cie.de/nano/en/index.htm
68	AAABSOLUT NANO für Aquarien	AAABSOLUT NANO	CH	?	yes	Home furnishing & household products	Home-Cleaning products	fluid		Nanosolutions	www.aabsolut.ch/
69	Antislip Spray	ProWIN	NL	NI, BE	no	Home furnishing & household products	Home-Cleaning products	cream		Internet search	www.prowin-info.net
70	Collonil Nanocream	Collonil Sulzenbrodt GmbH & Co.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.zwerfel.nl
71	Cerart square sealing	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
72	Nano Anistatic for Laminate	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
73	Nano Leer & Textiel Coating (Nano	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
74	Nano Meubeldans Anistatisch	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
75	NANO Regen-/Sneeuwspay	??	DU	NI	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.klingel.nl
76	Nano Voelt-en Vuilblokker	Deichmann	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.vanbergen.nl
77	Tena Nano vill-protector	Sara Lee	DU	NI, other EU countries	no	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.birk.be
78	Collonil Nanoprot spray	Collonil Sulzenbrodt GmbH & Co.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.zwerfel.nl
79	Holmenkol Textile Proof	HOLMENKOL Sport	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.verwerf-watersport.nl
80	NoFog-clean	HOLMENKOL Sport	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	http://www.holmenkol.be
81	SportProofCare	HOLMENKOL Sport	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	http://www.holmenkol.be
82	Nano Textielzoder-Verseveling	Kleinmann	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	spray		Internet search	www.kleinmann.net
83	Nano soil sealing for sucking subsoils	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
84	Soil sealing for low- to non-sucking subsoils	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
85	Wood & Stone Sealing (also	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
86	Waterproofing (also	Percent Ltd.	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	fluid		Internet search	www.rvd-services.com
87	ABROSIL® 0X-50 Fire resistant glass	Deussa	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.deussa.de/crede.com/
88	self-cleaning tile	Deutsche Steinzeug	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.deutsche-steinzeug.de
89	self-cleaning roof tiles	Erlus AG	DU	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.erlus.de
90	Pilgrimage Activ gel cleaning glass	Pilgrimage	UK	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.pilgrimage.com
91	Grout and tile cleaning product	GroutMaster	UK	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.groutmaster.com
92	GroutMaster soil enhancer	GroutMaster	UK	NI, other EU countries	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.groutmaster.com
93	Nano-silver cleaning board	FinePolymer, Inc.	Korea	DU, SI, IT	no	Home furnishing & household products	Home-Cleaning products	solid	nano-silver	Nanosolutions	www.welmering.de
94	Nano-Flon 3-delige panneuset	??	NI	FR, AL, BG, etc.	yes	Home furnishing & household products	Home-Cleaning products	solid		Internet search	www.klingel.nl
95	The Swiss Diamond Cookware	Swiss Diamond	CH	UK, FR, AL, BG, etc.	yes	Home furnishing & household products	Home-Cleaning products	solid		nanoshop	http://www.swissdiamond.com

Product no.	Name of product	Name of manufacturer	Country of manufacturing (abbreviation)	Country of distributors (abbreviation)	Order via internet (yes/no)	Type product (category as in Woodrow Wilson)	Subtype product	Matrix nanoparticles (fluid, solid, powder, coating, gas, etc.)	Chemical composition (gold, silver, TiO <sub>2</sub> , etc.)	Source	Website product
96	Bioni Clean	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	?	Nanosolutions	www.nano-coatings.eu
97	Bioni Grip	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	?	Nanosolutions	www.nano-coatings.eu
98	Bioni Hygiene	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	?	Nanosolutions	www.nano-coatings.eu
99	Bioni Nature	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	?	Nanosolutions	www.nano-coatings.eu
100	Bioni Roof	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	binders and	Nanosolutions	www.nano-coatings.eu
101	Bioni Perform	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	binders and	Nanosolutions	www.nano-coatings.eu
102	Bioni Perform	Bioni CS GmbH	DU	BE, LU, AT, ES, CH	no	Home furnishing & household products	Home-Paint	fluid	silicate	Nanosolutions	www.nano-coatings.eu
103	StoLotusan paint with Irise-effect	Sto AG	DU	NL, other EU countries	yes	Home furnishing & household products	Home-Paint	fluid	?	Internet search	www.sto.nl
104	Overheadluft	STAEDTLER®	DU	NL	yes	Miscellaneous	Misc-Miscellaneous	fluid	?	Internet search	http://discountoffice.nl
105	AAABSOLUT NANO sachet für	AAABSOLUT NANO	CH	?	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	tissue	?	Nanosolutions	www.aabsolut.ch/
106	Nano-Antibeschlag	De Cie GmbH (Nanotechnology)	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	tissue / spray	?	Nanosolutions	www.decie.de/nano/en/index.htm
107	Nano-Felgen-Protector	De Cie GmbH (Nanotechnology)	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	tissue / spray	?	Nanosolutions	www.decie.de/nano/en/index.htm
108	Nano Glas Protector	?	DU	NL	no	Motor vehicles	Motor-Exterior (coating/paint, tints)	?	?	Internet search	www.hallredx.nl
109	Mercedes-Benz paint finish by Daimler	Daimler Chrysler	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	coating	?	Woodrow Wilson	www.daimlerchrysler.com
110	Car 2 Component Paint Sealing Set	Percent Ltd.	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	www.rd-services.com
111	Car Glass Coating Set	Percent Ltd.	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	www.rd-services.com
112	Nano 2 Component boat's sealling	Percent Ltd.	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	www.rd-services.com
113	Nano Rim Seallant	Percent Ltd.	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	www.rd-services.com
114	Nano Labbescherming	ANWB	NL	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	https://webwinkel.anwb.nl/publicatie/aw
115	Nano Ruitbescherming	ANWB	NL	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	fluid/gray	?	Internet search	https://webwinkel.anwb.nl/publicatie/aw
116	Nano Felgen-Versiegelung	Kleinmann	DU	NL, other EU countries	yes	Motor vehicles	Motor-Exterior (coating/paint, tints)	tissue/fluid	?	Woodrow Wilson	www.kleinmann.net
117	Enditox	Okonish	UK	DU, SI, IT	no	Motor vehicles	Motor-Maintenance and accessories (wax/oil)	fluid	?	nanoshop	http://www.okonish.com
118	Nano-Silver FreshBox®	FinePolymer, Inc.	FR	NL, other EU countries	no	Packaging (incl. for food)	Pack-Food packaging	solid	silver	Nanosolutions	http://www.oxonite.com
119	Babolat® NS-10 Drive Tennis Racket	Babolat	FR	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	Carbon	Woodrow Wilson	www.welhering.de
120	Babolat® NS-10 Drive Tennis Racket	Babolat	FR	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	Carbon	Woodrow Wilson	www.welhering.de
121	Pro's Pro Nano-speed 5000 tennisracket	Montreal	FR	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	carbon	Internet search	www.powertennis.nl
122	Montreal hockey stick	Montreal	FR	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	carbon	nanoshop	http://www.montrealhockey.com/
123	Head Atomic Snow® Izor Skis	Head	AT	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	silicon oxide crys	Woodrow Wilson	www.head.com
124	Head Atomic Snow® Izor Skis	Head	AT	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	silicon oxide crys	Woodrow Wilson	www.head.com
125	Head Nano-Titanium Tennis Racquets by	Nano S GmbH	DU	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	titanium	nanoshop	http://www.nano-s GmbH.de/
126	NanoBall	?	CH	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	?	Internet search	www.powertennis.nl
127	Pro's Pro Nano Cyber Power 3 x 200 m	?	CH	NL, other EU countries	yes	Sporting goods	Sport-Rackets, bats, golf clubs, etc.	solid	?	Internet search	www.kikinge.nl
128	Outdoor schoen met NanoSphere	Raichle Urban	CH	NL	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.kikinge.nl
129	Overhead	??	??	NL	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.kikinge.nl
130	Pantalon	??	??	NL	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.kikinge.nl
131	Elements Nano-Tex Jacket by Jack Wolfskin	Jack Wolfskin	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.jack-wolf-skin.com
132	Hoggar Nano-Tex Pants by Jack Wolfskin	Jack Wolfskin	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.jack-wolf-skin.com
133	NorthPants Nano-Tex Pants by Jack Wolfskin	Jack Wolfskin	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.jack-wolf-skin.com
134	Overseas Nano-Tex Jacket by Jack Wolfskin	Jack Wolfskin	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.jack-wolf-skin.com
135	Nano Trousers by Pro-Idee GmbH	Pro-Idee GmbH	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.pro-idee.co.uk
136	Schöffel Heat pant	senior's sportswear company	DU	NL, other EU countries	no	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.zverfki.nl
137	Overheaden	Fress Work	NL	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.fress-work.com
138	Shield-system gloves	Franz Ziener GmbH & Co.	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.ziener.de
139	Tailfin Nano-Tex Jacket	Jack Wolfskin	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	www.jack-wolf-skin.com
140	Safari Jacket	Pro-Idee GmbH & Co. KG	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Woodrow Wilson	http://www.pro-idee.co.uk
141	Tafelaken en servetten	??	??	NL	yes	Textile (incl. clothes & upholstery)	Text-Clothing	textile	?	Internet search	www.kikinge.nl
142	Illuminated business hoodie	Bree	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Other textiles (sheets, etc.)	textile	?	nanoshop	http://www.bree.de
143	NanoUmbrella by Pro-Idee GmbH	Pro-Idee GmbH	DU	NL, other EU countries	yes	Textile (incl. clothes & upholstery)	Text-Other textiles (sheets, etc.)	textile	?	Woodrow Wilson	www.pro-idee.co.uk