



## Micro plastics in personal care products

Position Paper, August 2012

North Sea Foundation  
Marine Conservation Society  
Seas At Risk  
Plastic Soup Foundation

*A large number of personal care products contain micro plastics (micro beads). North Sea Foundation, the Marine Conservation Society, Seas at Risk and the Plastic Soup Foundation are campaigning to ban these plastic micro beads. It has been shown that micro beads are in the effluent of water treatment installations. From there they can reach the marine environment. Micro plastics are present in all the seas and oceans of the world.*

*Micro plastics can also enter organisms e.g. fish, lobster, bivalves, oysters, sea cucumbers, zooplankton and thereby enter the food chain. Eventually this could also affect human health.*

*Micro plastics in products such as facial cleaners and toothpaste are a relatively new source of pollution. Millions of people, unaware of the potential consequences, use these products on a daily basis and wash the plastic beads down the drain. It is essential that producers of such products should return to using organic degradable particles.*

***Plastics do not belong in the marine environment***

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### **Micro plastics in personal care products**

Three out of four scrubs and peelings contain micro plastics. Shampoos, soap, toothpaste, eyeliners, lip gloss, deodorant and sunblock sticks may also contain plastic particles. These micro particles are made of Polyethylene (PE), Polypropylene (PP), Polyethylene Terephthalate (PET), Polymethyl methacrylate (PMMA) and Nylon. PE and PP are the most common.

On behalf of the North Sea Foundation, the Institute for Environmental Studies (IVM) carried out research on several products for the presence of micro plastics. In one example 10.6% of the product weight consisted of polyethylene (PE). This means that for every bottle of 200ml used, 21g of micro plastics would end up in the sewer system. Another product examined in the study contained very small particles - 50 µm in diameter - of polyethylene terephthalate (PET).<sup>1</sup>

The average amount of micro plastic used by consumers is about 2.4 mg of micro plastic/person/day.<sup>2</sup> Some products contain as much as 10% PE, the equivalent of one teaspoon or 500 mg.

### **Can micro plastics enter the environment?**

Micro plastics that have originated from personal care products will end up in the sewer system after they have been flushed down the sink or bathtub and waste water treatment plants are currently not able to remove all these products as the PE beads are often too small to be filtered out. A number of studies<sup>3,4,5,6</sup> have shown that part of the micro plastics simply pass through the filters in the waste water treatment facilities. Furthermore, not all sewage water goes through a sewer treatment plant on its way to the ocean, not all cities are connected to a sewer treatment plant and heavy rainfalls can also cause sewer overflows. In all these circumstances untreated sewage is released into the environment.

### **Plastic Soup**

The American captain Charles Moore made a shocking discovery in 1997 when sailing the Pacific Ocean. In the middle of the ocean, thousands of miles away from civilization, he found plastic in a high concentration in an area as large as the combined surface of Portugal, Spain and France. Sea

currents collect the plastic bits and pieces and they form a gyre of marine litter. It is now known that, the so-called 'Great Pacific Garbage Patch' is not unique. Five such gyres exist and each one has an accumulation of litter. The oceans are the world's sinks for plastic particles and are fast becoming a "plastic soup".

### **Micro plastics in the oceans**

Day en Shaw found 3,370 objects per km<sup>2</sup> in the Pacific Ocean in the period of 1985-1988.<sup>7</sup> Moore<sup>8</sup> carried out a similar study in 1999 and found an average of 334,271 plastic particles per km<sup>2</sup> which suggests a huge increase in ten years' time.

#### *North Sea beaches*

Micro plastics are found in the North Sea and the coastal zone. Of the samples collected on the beaches and estuary of Plymouth 23 of the 30 samples contained synthetic polymers. On two Belgian beaches high concentrations of micro plastics were found, indicating an increase of micro plastic concentration over time. A common plastic particle found is most likely a 'scrubber' used in soaps on-board of ships.<sup>9</sup>

#### *North Sea*

Since the 1960's plankton samples have been collected on the route Aberdeen-Shetland islands (Scotland) and the route Sule Skerry (Scotland) to Iceland. Analyses of these samples show that the number of micro plastics increased significantly over time. Norén found copious amounts of micro plastic particles on the Swedish coast (150-2,400 particles per m<sup>3</sup>).<sup>10</sup> In 2011 North Sea Foundation took samples on the Doggersbank (an area of the North Sea on the boarder of the Netherlands and England) and found micro plastics varying from 0.2 to 1.6 particles/m<sup>3</sup>.<sup>1</sup>

### **Consequences of micro plastics in the environment**

#### *Spreading in oceans and seas*

Under the influence of sea water, the sun, action of sand and rocks, plastic objects break up into smaller and smaller pieces and spread all over the world seas and oceans.

#### *Accumulation*

Plastic particles are not biodegradable. Considering the rapid increase of plastic production, the long life existence of plastic and its single use character, plastic pollution will only increase unless action is taken now.<sup>11</sup>

#### *Foodchain*

Micro plastics can enter the bodies of organisms. Plankton<sup>12</sup>, sea cucumbers<sup>13</sup>, mussels and oysters<sup>14</sup>, lobsters<sup>15</sup> and fish<sup>16</sup> are examples of marine species in which micro plastic particles have been found. Research suggests this can have consequences for toxicological effects and the transfer to higher trophic levels.<sup>17</sup> Because plastic enters our food chain it ultimately threatens our own health.

#### *Toxic substances*

Plastics contain additives like flame retardants, antioxidants, antistatic- and softening agents to give it specific characteristics. These chemicals can be released and enter the environment. Other chemicals such as Persistent Organic Pollutants (POP's) which are already in the environment can be adsorbed onto plastic particles; in particular hydrophobic substances (fat soluble). Examples of chemicals found on plastic particles are DDT, PCB's, nonylphenol. On the surface of plastic particles relative high concentrations of toxic substances have been found.<sup>18,19</sup>

### **Global Plastics**

The earth is populated by 7 billion people and it is expected that there will be 9.5 billion people by 2050. The world production of plastics will increase further together with the plastic footprint and the pressure on the marine environment. Plastic becomes more and more a serious global problem.

Our seas and oceans supply us with vital human needs like food, oxygen and a stable climate. The earth's surface consists of 72% of oceans and 70% of the oxygen production on earth is provided by



our oceans. Apart from moral considerations and the protection of life in the oceans this should be reason enough to be very careful with this ecosystem.

### **What to do?**

The problem of plastic pollution is a very complex and huge one. The sources are very diverse, shipping, fishing, tourism, sanitation, consumers, river inputs, offshore, landfills and the scale varies from local pollution to a global scale. It is not always clear which sources is responsible for which pollution. Nevertheless one thing is very clear: **plastics do not belong in the marine environment.**

As some sources of marine litter are hard to tackle, some are very easy. Micro plastics added to consumer products are a clear example of the last.

**We ask for a complete ban of micro plastics in personal care products** and believe that:

- Plastic does not belong in the oceans. We must prevent new sources of plastic pollution entering the seas and oceans;
- There should be a global ban on using micro plastics in personal care products. Let's start in Europe;
- A responsible company does not use micro plastics as an ingredient in its products.

### **We are asking that:**

- *Retailers STOP already with selling any product containing plastic ingredients as soon as possible*
- *Companies STOP using micro beads inside products and return to the natural sources as soon as possible. Natural abrasive materials to substitute for the plastic ingredients are readily available!*
- *European politicians to formulate effective legislation to BAN the sale and production of products containing micro beads as of January 1<sup>st</sup> 2014;*

*We ask:*

- *Consumers to BOYCOTT products containing plastic ingredients, starting now.*



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