

## *Supporting information*

### **Nanoplastics released from daily used silicone and latex products during mechanical breakdown**

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#### **Material**

##### *Silicone*

Silicone 1 was bought from [www.apotea.se](http://www.apotea.se), and were pacifiers manufactured by ESSKA, [www.esska.nu](http://www.esska.nu), with a silicone rubber bubble. Silicone 2 was from illbruck, [www.illbruck.com](http://www.illbruck.com). illbruck GS202 is silicone used in building constructions as a sealing material.

##### *Latex*

Latex was bought from [www.apotea.se](http://www.apotea.se), and were pacifiers manufactured by ESSKA, [www.esska.nu](http://www.esska.nu), with a latex rubber bubble.

##### *Immersion blender*

In order to validate how robust, the immersion blender protocol is when it comes to produce wear NPs from plastics, four different immersion blenders were tested: Electrolux ESTM 500, BOSCH powermaxx 750 W, Robot coupe Mini MP 240 v.v. and BOSCH ErgoMixx 600 W, see Figure S1.

The test was set up by blending MilliQ H<sub>2</sub>O in a 500 mL glass beaker at their maximum speed for 5 min. Of the tested blenders, it was only BOSCH ErgoMixx 600 W that did not release a significant number of particles in the nano size range (see Figure S2 and S3).

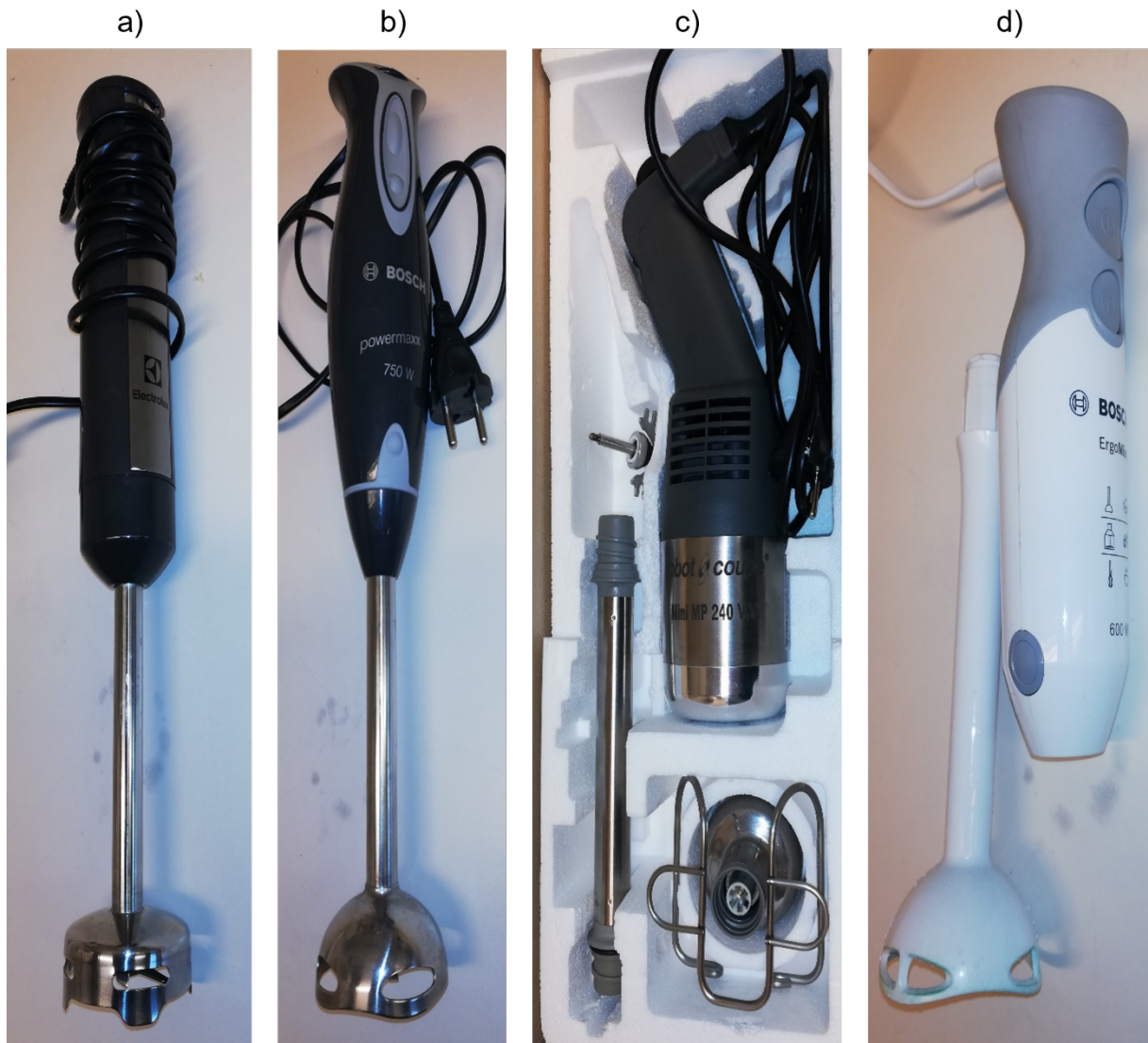
The results for BOSCH powermaxx 750 W can be seen in Figure S3, since it released significant more NPs compare to the other mixers. The mixer was tested at two different times. The data reported here is the data from the second test in which the samples, three repeats, were diluted 10 times with MilliQ H<sub>2</sub>O in order to get a concentration that work for the NTA. The data for the BOSCH powermaxx 750 W were collected and analysed using the software NanoSight NTA version 3.1.

The NTA data for the control experiments are summarized in Table S1.

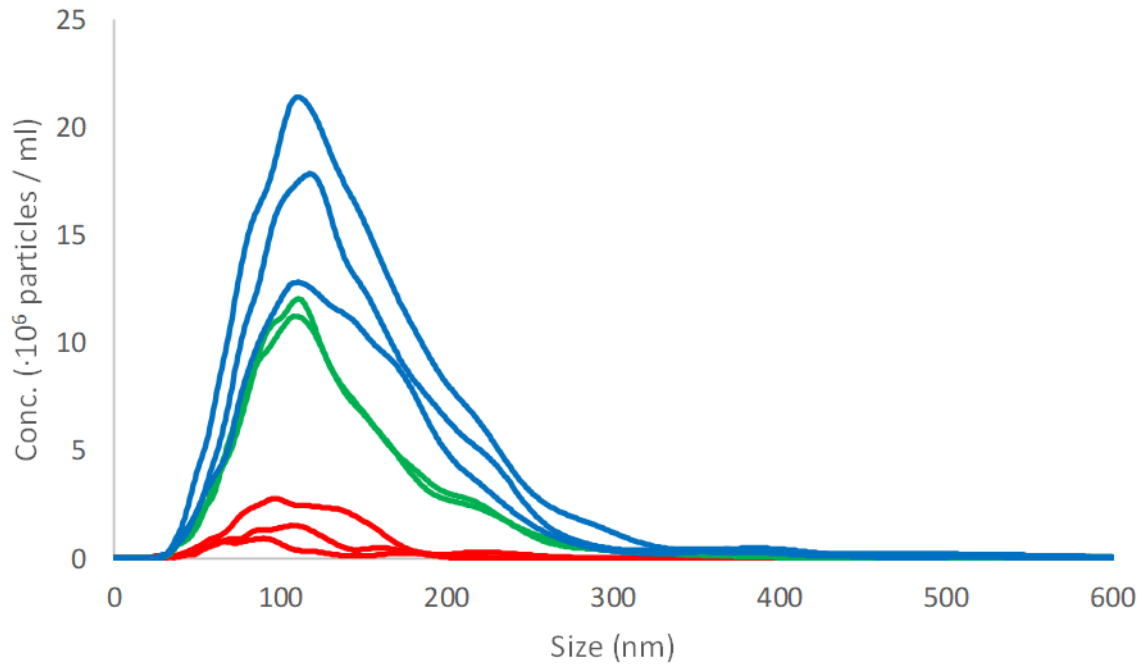
#### **Problems with BOSCH ErgoMixx 600 W**

We have so far bought four complete (both motor and knife) sets of BOSCH ErgoMixx 600 W. Three of these have worked, in the sense that they did not release nanoparticles in control experiments. We did also buy ten separate new knives from the manufacture, however, all

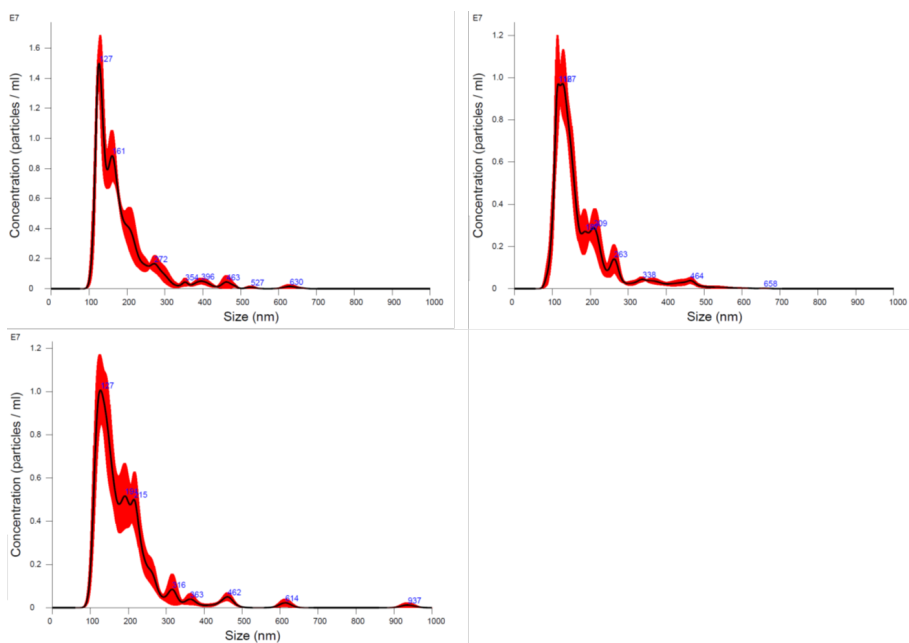
of them were useless for our purpose. To our surprise, all of them released material in the control experiment, some of them released something that actually miss-coloured the water, see Figure S4. Our interpretation of these findings is that the knife probably has a shelf life, hence, if it is too old some component in it will start to release material during use.



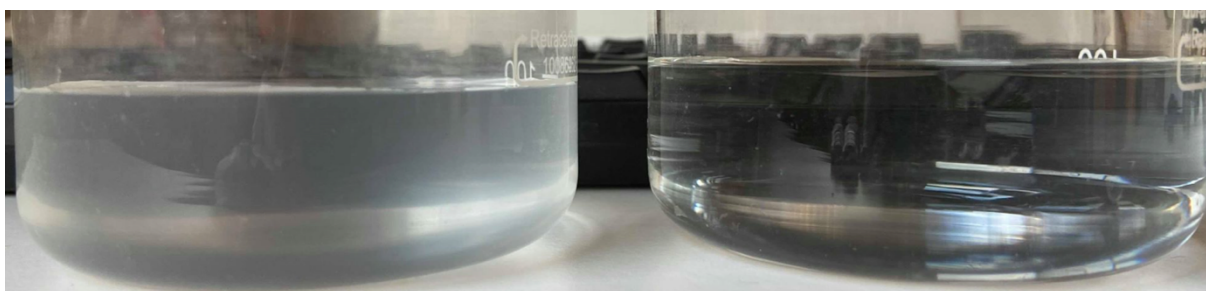
**Fig S1. Different immersion blenders tested.** a) Electrolux ESTM 500 b) BOSCH powermaxx 750 W c) Robot coupe Mini MP 240 v.v. and d) BOSCH ErgoMixx 600 W.



**Fig S2. NTA data of control experiments for different immersion blenders.** Different immersion blenders particle release after 5 minutes mixing of water. Green = Electrolux ESTM 500, Blue = Robot coupe Mini MP 240 v.v. and Red = BOSCH ErgoMixx 600 W. Run with Camera Level 13.



**Fig S3. NTA measurements on the samples for the BOSCH powermaxx 750 W immersion blender.** Each graph shows the medium value, black line, and the standard deviation, red area, for 5 separate measurements of three different preparations with the mixer. The samples were diluted 10 times with MilliQ water before the NTA measurement.



**Fig S4. Picture of water after using different knives.** To the left, MilliQ H<sub>2</sub>O mixed 1 min with BOSCH ErgoMixx 600 W replacing knife. To the right control (unmixed MilliQ H<sub>2</sub>O).

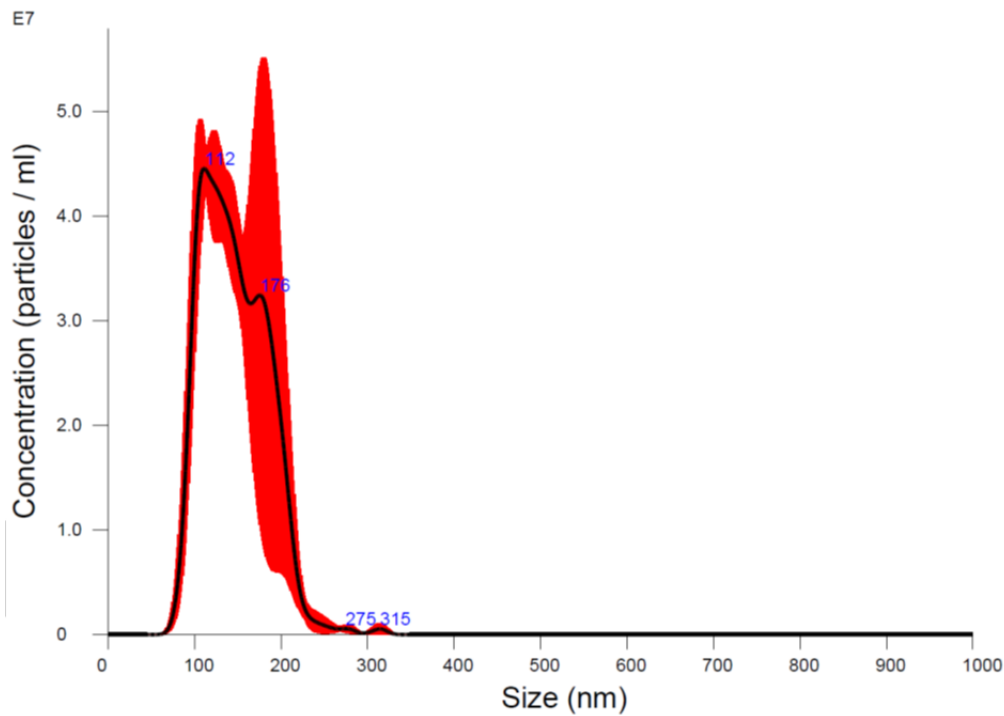
**Table S1. NTA data for tested Immersion Blenders.**

| Run and analysed with NTA software NanoSight NTA version 2.3 | Camera Level | Mode | Mean          | Equivalent particle concentration | Valid Tracks      |
|--|--------------|------|---------------|-----------------------------------|-------------------|
|  |              | (nm) | (nm)          | ( $\cdot 10^8$ particles/ml)      | (No.)             |
| Electrolux ESTM 500  | 13           | 111  | 151 $\pm$ 108 | 12,3                              | 2582              |
| Electrolux ESTM 500  | 13           | 110  | 140 $\pm$ 67  | 12,1                              | 2460              |
| Robot coupe Mini MP 240 v.v.                                 | 13           | 111  | 146 $\pm$ 64  | 26,3                              | 4733              |
| Robot coupe Mini MP 240 v.v.                                 | 13           | 111  | 149 $\pm$ 71  | 16,3                              | 2892              |
| Robot coupe Mini MP 240 v.v.                                 | 13           | 118  | 151 $\pm$ 75  | 20,9                              | 3884              |
| BOSCH ErgoMixx 600 W   | 13           | 90   | 125 $\pm$ 67  | 0,8                               | 158               |
| BOSCH ErgoMixx 600 W   | 13           | 97   | 114 $\pm$ 33  | 2,5                               | 525               |
| BOSCH ErgoMixx 600 W   | 13           | 109  | 111 $\pm$ 40  | 1,2                               | 233               |
| Run and analysed with NTA software NanoSight NTA version 3.1 |              |      |               |                                   |                   |
| BOSCH powermaxx 750 W  | 12           | 126  | 185 $\pm$ 82  | 10,6                              | N.A. <sup>1</sup> |
| BOSCH powermaxx 750 W  | 12           | 126  | 191 $\pm$ 98  | 10                                | N.A. <sup>1</sup> |
| BOSCH powermaxx 750 W  | 12           | 127  | 175 $\pm$ 86  | 8,2                               | N.A. <sup>1</sup> |

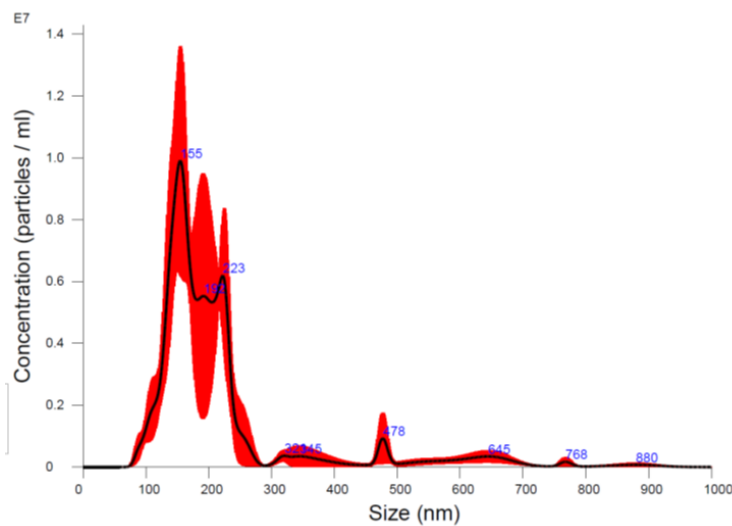
<sup>1</sup> N.A.: Not Applicable since the reported values are the average of five individual measurements.

**Table S2. NTA data for silicone and latex pacifiers after being subjected to 5 min mechanical wear in MilliQ respectively tap water.**

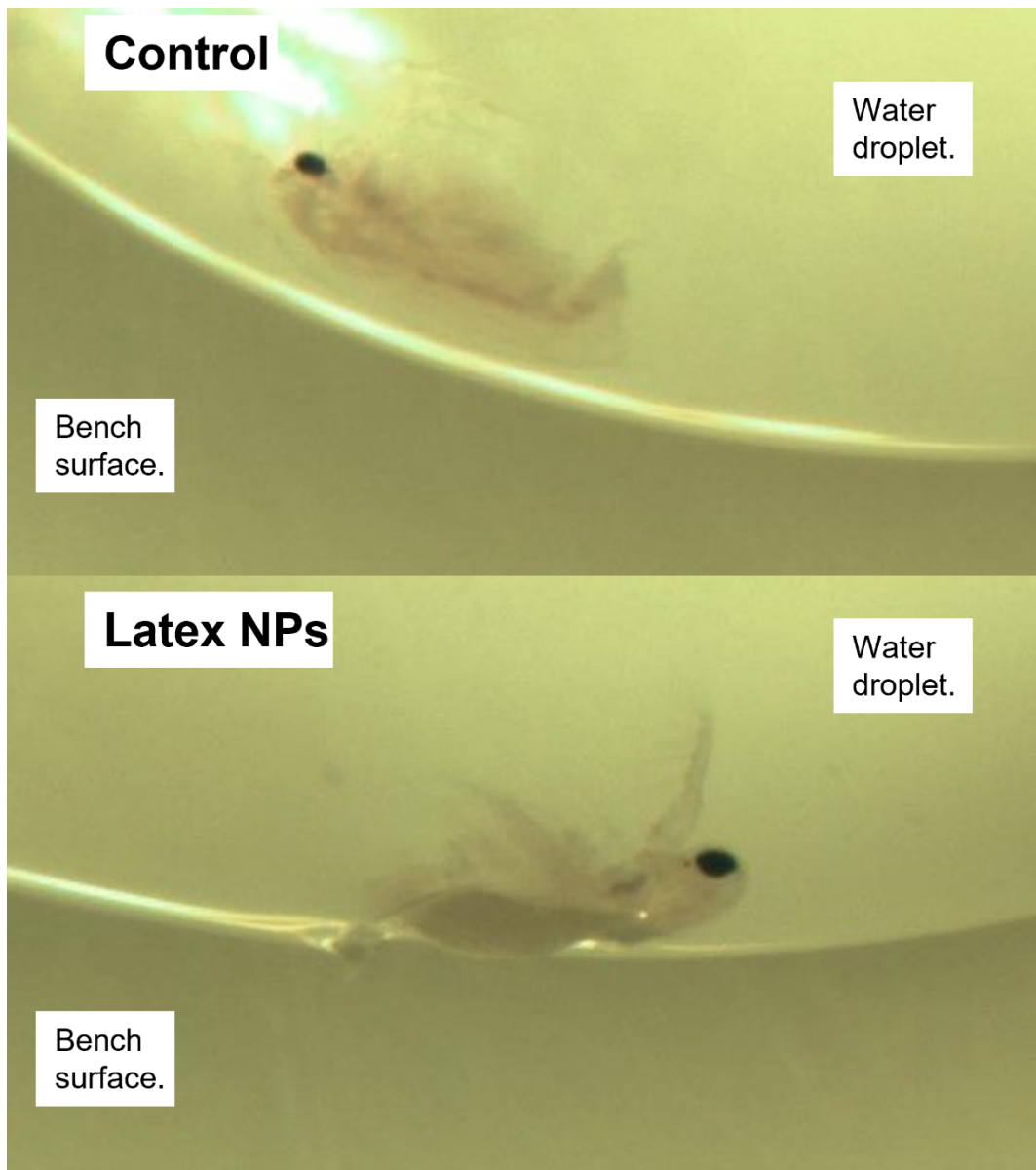
|            |                         | NTA       |               |
|------------|-------------------------|-----------|---------------|
|            |                         | Mode (nm) | Mean (nm)     |
| Silicone 1 | MilliQ H <sub>2</sub> O | 109       | 129 $\pm$ 47  |
|            | Tap H <sub>2</sub> O    | 108       | 143 $\pm$ 34  |
| Latex      | MilliQ H <sub>2</sub> O | 105       | 143 $\pm$ 59  |
|            | Tap H <sub>2</sub> O    | 163       | 218 $\pm$ 131 |



**Fig S5. NTA data for Silicone in tap water.** The graph shows the medium value, black line, and the standard deviation, red area, for 3 separate measurements of one sample. Data were generated and analysed with NanoSight NTA version 3.1.



**Fig S6. NTA data for Latex in tap water.** The graph shows the medium value, black line, and the standard deviation, red area, for 3 separate measurements of one sample. Data were generated and analysed with NanoSight NTA version 3.1.



*Figure S7. Droplet of control sample with D. magna on the top and droplet of latex sample with D. magna on the bottom.*