

Fraunhofer Institute

This is a summary of the long-term tests of the DELPHIN DP-2002 by the Fraunhofer Institute for Toxicology and Aerosol Research.

The DELPHIN System with its water and ultrafine particle separator (L-Lamella), which operates without any kind of filter, gains more and more acceptance with consumers.

Since we feel we owe it to our clients, we wanted to know precise details. Therefore, we spared neither cost nor effort to have the high hygiene standards of DELPHIN tested. We gave the task of testing DELPHIN to the world-famous and internationally accepted Fraunhofer Institute for Toxicology and Aerosol Research.

The definition of the task was to find out in a long-term test, if germs can form in an appliance and then get into the room air, when said appliance is being used.

1. Test:

Two DELPHIN appliances were tested together, one had been used in a big household for about 2 years and one was assessed and sent back by the magazine Ökotest.

Table 1: germ count determination with impinger, 30 ml of isotonic NaCl solution

period of sampling	room air	2-year old household appliance		appliance from Ökotest	
	30 min.	15 min.	30 min.	15 min.	30 min.
CFU/ 0,2 ml Ausstrich	0	1	2	0	0
CFU/ 0,5 ml Ausstrich	1	2	6	1	0
CFU/ 1,0 ml Ausstrich	3	1	3	0	2
CFU/ 25 ml Ausstrich	29	17	6	7	25
Summe CFU	33	21	17	8	27
CFU/m ³	88	112	45	43	72

During the 30 minutes measurements, the number of germs in the exhaust air of the **household appliance of DELPHIN were 48 % lower** and the **appliance of Ökotest was 18 % lower than the number of germs in the air of the room**

The result: "The germ counts measured in the exhaust air of the cleaner were not higher than those of the room air." (Original text excerpted from the test report)

2. Test:

3 DELPHIN appliances were used for further long-term test. The real household dust was taken from several households from the Hannover region and homogenised prior to the tests in accordance with the tests by Ökotest.

Table 2: Tests with real household dust added with approximately 2 million germs per gramm.

day	reference water bath germs per gramm	sampling* 1 CFU/m ³	sampling* 2 CFU/m ³	sampling* 3 CFU/m ³
0	2.100.000	0	120	24
7	2.500.000	0	0	0
14	2.400.000	0	0	24
21	2.000.000	0	0	0
28	1.700.000	8	0	32

*Sampling shows germ count found in exhaust air.

Approximately 75,000,000 germs were sucked in and 4160 germs were found in the exhaust air during this long-term test. This corresponds to a retention of 99.995 %. In the course of time, an increase in contamination could not be found.

3. Test:

To determine whether and, if so, how many germs were extracted and released from the water bath, approximately 10 million bacterias were added to the water bath per test. The measurements were repeated 3 times each day. (measurement time: 4 times 10 minutes in a row)

Table 3: release of germs from the water bath

day	reference water bath germs in 2 litres of water	sampling* 1 CFU/m ³	sampling* 2 CFU/m ³	sampling* 3 CFU/m ³
0	10.000.000	0	16	0
2	8.500.000	0	0	8
4	11.900.000	32	8	8
7	12.000000	8	0	0
10	2.700.000	8	0	0

*Sampling shows germ count found in exhaust air.

In this long-term test, a total of approximately 55,230,000 bacteria were added to the water and during a suction period of 600 minutes or 1200 m³ suction intake, approximately 3520 bacteria were found in the exhaust air. **This corresponds to a retention of 99.994 %.**

A sensational and excellent result was determined here for the Delphin 2002. Over time, no increase of contamination could be found.

The result: "6 germs or rather 6 CFU/m³ exhaust air were found in the liquid here. Here, too, no increase of CFU versus time was found and thus no tendency to germ formation has to be expected." (Original text excerpted from the test report)

Summarising, one can state:

"No germ formation by bacteria was found during the tests. Thus one should assume that no bacteria germ formation will occur when the appliance is used for the purpose intended and in accordance with the operating manual." (Original text excerpted from the test report)

This shows that the open design of the appliance, which has no filter to prevent a desiccation of the appliance, is the right way to go.

The test executed by the Fraunhofer Institute clearly shows that the DELPHIN appliance is precisely the appliance to have when it comes to cleaning a room and cannot be compared with customary vacuum cleaners or other water appliances that retain fine dust via filters.

This test result only applies to the DELPHIN DP 2002 appliance and cannot be transferred to other products.