



For a better air quality

Get rid of viruses, bacteria and moulds
Disinfect the air you breathe

PHILIPS

UVC Technology
Air disinfection

PHILIPS UV-C lamp • **3M** filter • **ebm papst** fan

How important is the air for us?

The air we inhale is one of our most important basic needs. Air is essential for us to be able to live on Earth. Clean, fresh air results in better work performance, a good mood and a feeling of fitness and good health – you certainly know how relaxing a clean and natural environment can be. Air has a greater impact on our lives than we realise.

Air can contain just as many good substances as bad. Our air is not equally clean everywhere we go. Infectious bacteria, viruses and moulds spread easily through the air and can make us sick. Air can also contain pollens and dust particles that can cause allergic reactions in people who are sensitive to them. We all know how easily we can catch the flu virus or be plagued by hay fever in the spring.

Many people spend most of their day in enclosed spaces – at work, school or even at home. Test results show that enclosed spaces contain much more bacteria, viruses and moulds than open areas. The air in enclosed spaces is usually poorly ventilated and filled with dust, which means it also contains many contaminants. In addition to bacteria, viruses, moulds and pollen, air can also contain cigarette smoke, food or pet odours, and exhaust fumes. Elevated quantities of these kinds of infectious substances work as stimulating mechanisms for a range of various illnesses, of which influenza and asthma are the most familiar.

The contamination of the earth, and air contamination along with it, has had our attention for a long time now. Today there are international agreements in place that are intended to reduce environmental pollution. New national and international regulations and laws have also been implemented to improve the quality of the air. These measures have resulted in an industry in which new technologies are developed to clean the air in enclosed spaces.

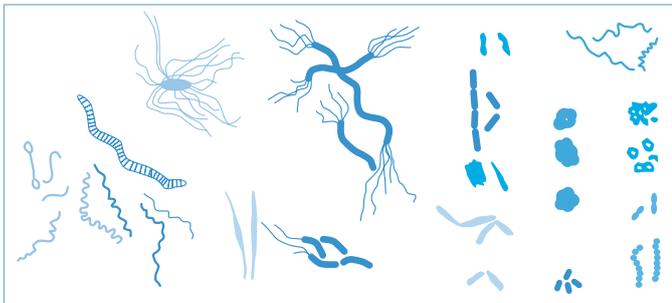


Figure 1.1 Some examples of bacteria varieties.



Figure 1.2 Bacteria

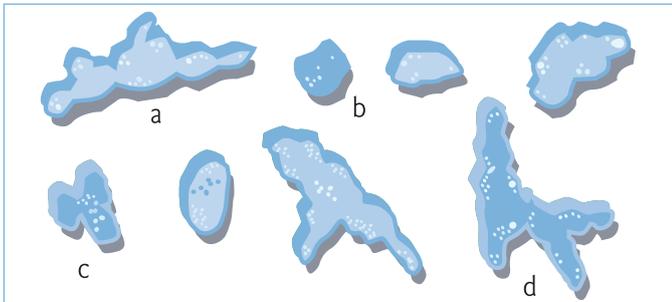


Figure 2.1 Brewer's yeast (*Saccharomyces cerevisiae*) in various stages of development: a. Various forms b. Yeast cell with spores c. Yeast spores d. Yeast spores after germination.

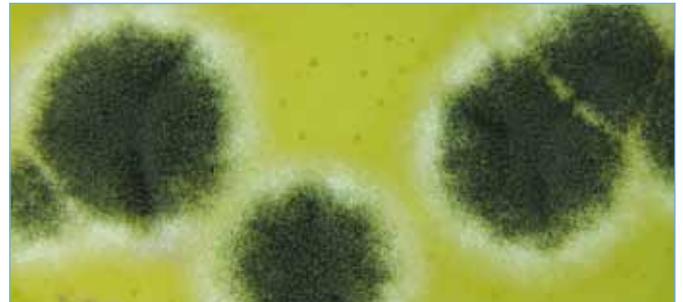


Figure 2.2 Moulds

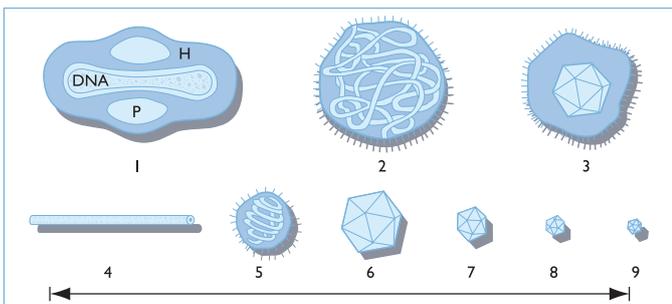


Figure 3.1 Relative shapes and sizes of some types of viruses.
1. Smallpox virus • **2.** Mumps virus • **3.** Herpes virus • **4.** Tobacco mosaic virus
5. Influenza virus • **6.** Insect polyhedral virus • **7.** Adeno virus • **8.** Polyoma virus
9. Poliomyelitis virus • **DNA** = virus DNA • **P** = elliptical protein body
H = enveloping layers

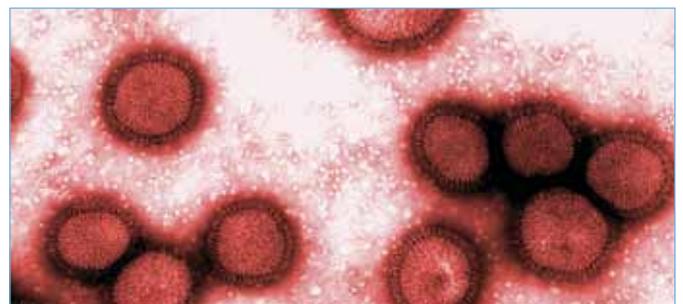


Figure 3.2 Influenza virus

A revolution in air disinfection

ætaire is a revolutionary new air cleaning product. With the ætaire you have an air filter, an air ioniser and a UV-C sanitising light in one professional system.

You can now easily eliminate bacteria, viruses, moulds, pollens and dust particles from the air you breathe. The air in your living environment is continuously protected, and you can prevent illnesses, allergies and the spread of the substances that cause them.

1. Circulation

The ebm-papst fan draws the air in the room into the bottom of the unit, creating air circulation. The fan circulates 50 m³ of air per hour through the ætaire. Depending on the size of the room, the fan can be set to 25 or 50 m³ per hour.



Sound at 25 m³ = 25db (very quiet)
Sound at 50 m³ = 28db

To compare:

- Recording studio: 30db
- Refrigerator: 45-50 db
- Coffee-maker: 50-60db
- Traffic: 70db
- Vacuum cleaner: 60-85db

2. Ionisation

The ionizer introduces 8.5 million negative ions per cubic centimetre into the air. Most of the dust particles in an enclosed space normally have a positive charge. Negative ions have the effect of attracting positive dust particles.

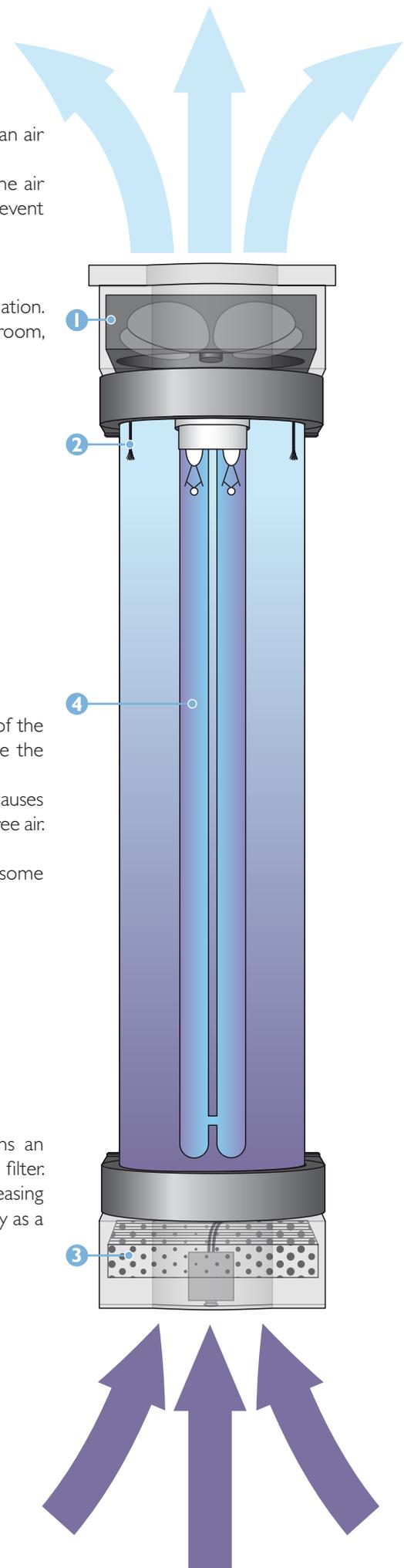
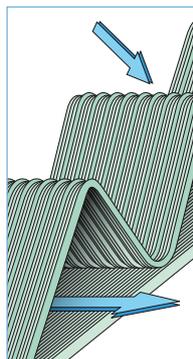
By adding negative ions to the air, the positive particles in the air become heavier, which causes them to sink towards the ground. The process therefore results in cleaner, dust- and pollen-free air.

At places where the air is clean, the air contains many more negative ions. Here are some examples of the great number of negative ions in various surroundings, per cm³:

- Waterfall, forest: 50,000
- Mountains, sea: 5,000
- Outskirts of a city, meadow, field: 700-1,500
- Park in the city: 400-600
- Sidewalk: 100-200
- Home in the city centre: 40-50
- Enclosed office with air conditioning: 0-25

3. Filter

The air passes through the 3M High Air Flow (HAF) filter. This special filter contains an antimicrobial film layer that prevents the growth of various infectious substances on the filter. The antimicrobial media slows the rate at which the filter becomes clogged, thereby increasing its service life. Those dust particles and pollen in the air that do not settle out immediately as a result of the ionisation are filtered out by the 3M filter.

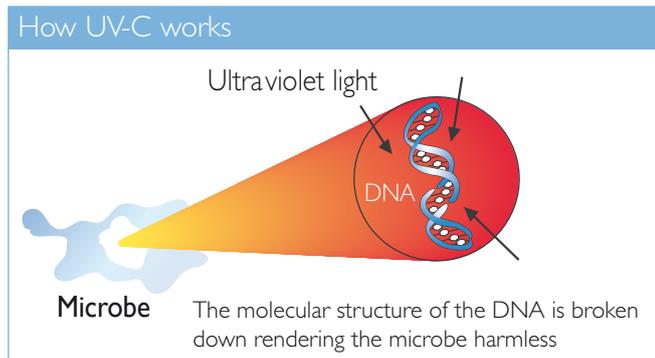


4. UV-C sanitising light

After passing through the filter, the air is exposed to the UV-C sanitising light. The special Philips UV-C lamp in the ætaire produces ultraviolet radiation at a wavelength of 253.7 nm. This UV-C light kills bacteria, viruses, moulds and other primitive organisms. The radiation destroys the DNA structure of micro-organisms and prevents their reproduction. This method even works if the micro-organisms have become immune to other disinfection methods. Your air will be disinfected in a safe and efficient manner, and you will enjoy excellent air quality.

Technical specifications Philips TUV PL-L 60W/4P HO lamp

- TUV PL-L 60 Watt
- UV-C output 19 Watt
- Dose 4,23 mJ/cm² (Flow 50m³/hr)



5. Timer

The ætaire includes an integrated hours counter that accurately keeps track of the number of hours the lamp has been on. You know exactly when the lamp and the filter are due for replacement. With the timer you can set the ætaire to operate at the desired speed during each hour of the day. For example: In a bedroom, the ætaire doesn't have to run at 50 m³ per hour during the night; 25 m³ per hour is more than adequate. In the family doctor's waiting room, full speed is probably the best choice. So, you see, the ætaire can be set to accommodate any room or situation.

6. Housing

The special aluminium interior of the housing results in extra reflection of the UV-C radiation. This increases the efficiency of the UV-C by up to 50%. The reflection exposes the micro-organisms to the deadly UV-C radiation from every direction, maximising its effectiveness.

7. Clean air

The exiting air has been 90% filtered, ionised and disinfected. Clean air in your living environment is better for your health: it increases your body's resistance, it relieves or eliminates respiratory allergies, and fears and depression subside or disappear. The most important effect is that illness can be prevented.

Why Philips lamps?

As the world's largest lamp manufacturer, Philips has a reputation for innovation, efficiency and high quality. No other lamp manufacturer can offer you the lighting knowledge and expertise that Philips has gained over the course of more than a hundred years. The range of lamps offered is vast and includes both low- and medium-pressure mercury lamps.

UV-C treatment is not only used for disinfection of air, but for water and surface disinfection as well. Philips has extensive experience in the application of these technologies in hospitals, bacteriological research laboratories, the pharmaceutical and food-processing industry, drinking water and waste water treatment, air handling systems, etc.

Other advantages of Philips technology include:

- Long service life of the lamps
- Highest end of life output
- Wide range of single-ended lamps permits compact equipment and easy lamp replacement
- Very low mercury dose to protect the environment
- Consistent quality for equipment reliability

Why 3M filters?

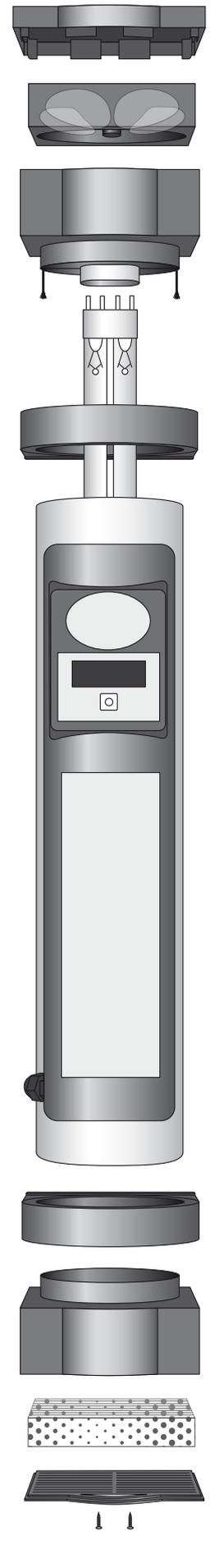
3M is fundamentally a science-based company. They produce thousands of imaginative products and are leader in scores of markets – from health care and highway safety to office products, abrasives and adhesives.

The 3M High Air Flow (HAF) air filtration media with antimicrobial agent effectively capture larger particles from the air. These filters attract and capture dust and are ideal for high-velocity equipment. A 3M filter is ideal to help remove larger particles such as dust, pollen, mould spores and pet dander from the air passing through the filter. The antimicrobial agent helps inhibit the growth of mould and mildew on the filter media.

Why ebm-papst fans?

ebm-papst is a market leader in fans, blowers and drives and offers a uniquely comprehensive range of products with German quality. 10,000 committed individuals are busy in Germany and throughout the world developing and producing products they care about with a passion, striving for the perfect application solutions in the most diverse range of industries. As a member of ZVEI (German Association of Electrical and Electronic Industries), ebm-papst is clearly strongly committed to gaining even wider acceptance of efficient technology. Energy efficiency is their business, for instance, which aims at sponsoring joint efforts that will benefit government initiatives, the economy and end users.

The ebm-papst 4400 fan has been built using state-of-the-art technologies. The vanes, for example, are fitted with winglets that result in a 3dB noise reduction in comparison to a standard fan. The fan is not only quiet; intelligence built-into the motor also makes it very economical to operate. The fan is extremely energy efficient. The power consumption at the highest speed is four watts, and that drops to just one watt at the night setting.



Susceptibility of different micro-organisms against UV-C radiation

Bacteria	Organism group	Member of group
Most susceptible	Vegetative Bacteria	Staphylococcus aureus
		Streptococcus progenies
		Escherichia coli
		Pseudomonas aeruginosa
		Serratia marcescens
	Mycobacteria	Mycobacterium tuberculosis
		Mycobacterium bovis
		Mycobacterium leprae
	Bacterial Spore	Bacillus anthracis
		Bacillus cereus
		Bacillus subtilis
	Fungal Spores	Aspergillus versicolor
		Penicillium chrysogenum
		Stachybotrys chartarum
	Least susceptible	



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