RESPILON WINDOW MEMBRANE - RWM6.0
Frequently Asked Questions

1) Functionality and Properties

How does the membrane work?

The functional part of the product consists of a nanofiber membrane. It is an extremely dense net made of exceptionally fine fibers with diameters ranging from 500 to 800 nanometres, which means thousand times thinner than a human hair. Compared to other textiles or membranes, nanofibers feature significantly higher filtration properties. Nanofiber filtration is based on mechanical barrier – the overwhelming majority of pollutants has higher diameter than the pores in the membrane (approx. 1 micrometre). Moreover, nanofibers are able to trap also the particles and microorganisms that are smaller than the pore diameter. This is achieved thanks to the electrostatic charge that the membrane gets during the production process through the method of electrospinning. The particles that touch the membrane are attracted to the nanofiber – similarly as a metal and a magnet – and will not get inside. Thanks to this property, the nanofiber structure safely captures most of the dangerous particles from the air.

What is the uniqueness of the product?

It is the first window screen primarily intended for the protection against smog. While conventional insect screens let all solid particles inside, and anti-pollen screens capture bigger pollen seeds at best, nanofiber membrane, thanks to its density, mechanically captures even much smaller particles produced by burning of solid fuels or in car engines.

What is the difference between nanofiber membrane and regular anti-dust screen?

Common anti-pollen or anti-dust screens have much bigger pores/loops, so particles with the diameter of 1 micrometre or fractions of micrometre can easily get through them. These smallest particles are the most dangerous, because when aspirated, they penetrate deep into the airways and settle there (in extreme cases, they can get into the bloodstream). Only membrane density on the nano level ensures entrapment of most harmful particles and microorganisms.

Which threats does the membrane protect from?

It reliably captures most smog, pollen and dust particles. It also filtrates several microorganisms, particularly mites and airborne bacteria. Moreover, it does not let fungal allergens, which normally get indoors during ventilation and cause dangerous illnesses, to get inside.

I suffer from allergy. How can this product help?

There are plenty of irritating allergens in the air. During the season, they are represented by pollens of various plants, spores and moulds, or by dust particles all year round, which the nanofibers won't let inside and will prevent the user from breathing these harmful substances. In addition to people with allergies and asthmatics, the membrane properties

will also be appreciated by people who take care of their health in the long term and who live in an area polluted with car or factory exhausts, or simply in a dusty environment.

The membrane is part of "home protection" RESPILON® product section. How does it protect my home?
Besides the fact that the membrane protects human health, it is also beneficial for the whole household. As it does not let smog and dust inside, less dirt accumulates in the house. The membrane users therefore do not need to clean so often and their house can become an even more pleasant place to live.

Who is a typical end user?
Nanofiber window membrane is intended for everyone who wishes to breath clean air also indoors. It is particularly appropriate for people living in extremely polluted areas, families with new-borns, pregnant women, children and the elderly, people suffering from allergies or asthma and patients with weakened immune system.

Can the membrane filter viruses and bacteria?
Higher the filtration efficiency of any mechanical filter, lower the permeability of the filter (and vice versa). In the case of a window membrane, we had to choose such a density and weight (grams per square metre) of the nanofibers to allow sufficient air change indoors while maintaining high level of entrapment. The nanofiber filter used thus traps most bacteria, but it does not trap viruses. If the membrane captured also viruses, its permeability would not comply with hygienic standards.

Can the membrane block odour as well?
Smog, dust or allergens consist of solid particles, which are captured by the nanofiber filter. However, odour consists of gas molecules, which can pass through the filter (similarly to oxygen – otherwise the membrane would not be permeable). Partial penetration of odours therefore does not mean the membrane is not working properly. Currently, we are developing a next product generation, which would be able to deal also with odours.

What is the filtration efficiency?
A window membrane captures up to 92.83% of particles of the size of 1 micrometre (i.e. particles from the car exhaust fumes) and 98.23% of particles of the size of 2.5 micrometre (smog particles produced by furnaces and factories). And the efficiency grows as the size of the particles (for instance dust particles) increases. This level of filtration was proved by an independent testing by TÜV SÜD.

What is the visibility of the screen?
Less light gets into the room through a window with an installed membrane. However, it is not too little to impact the interior significantly. Moreover, not many people ventilate the room by opening more than one window – the remaining closed windows without the membrane ensure sufficient sunlight. In areas where sun shines with great intensity for most of the day, the membrane is actually appreciated as a partial shielding.

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Is the product UV resistant?

The composite is stabilized against UV radiation. And it also protects the interior and its inhabitants against the ultraviolet component of light as it captures 50% of UV radiation of medium and long wavelength.

Is the screen breathable?

While most harmful particles have a bigger diameter than that of the microscopic pores in the membrane, oxygen molecule, on the other hand, has a smaller diameter, which makes the membrane permeable. Independent tests carried out by the Engineering Test Institute (Czech Republic) confirmed, that at a normal wind speed of 0.25–1.25 m/s, the pressure loss ranges from 3 to 90 Pa. Such a value guarantees sufficient permeability of the membrane for efficient ventilation of the interior.

Is the material waterproof?

The membrane captures significant amount of rainwater and during normal precipitations, it allows ventilation even when it rains. Only during rainstorms and strong wind, it is recommended to close the window.

Is the material wind-resistant?

The membrane allows sufficient penetration of air to ensure comfortable ventilation, but at the same time, it prevents a normal wind to get inside. When installed by a certified technician, there is no risk of breaking the frame or making the frame untightened. Only at extreme wind speed and gust wind, we recommend to remove the frame with the membrane from the window, especially a large one, to prevent damages to the membrane.

What is your recommendation for maintaining good air circulation?

To achieve the most efficient air change, we recommend installing the membrane in two windows located opposite to each other. When opening both the windows, the so-called stack or chimney effect takes place, contributing to faster ventilation and lower heat losses.

2) Installation, Technical Information and Maintenance

What is the composition of the membrane?

The product has the form of a three-layer sandwich. The fiber itself is made of PVDF. From the outside (facing outdoors), the fiber is protected with a permeable polyvinyl chloride mesh, while the inside layer of nanofiber (facing indoors) is protected by a polyester layer. The whole is an extremely resistant composite that is stable under UV radiation as well as under mechanical load.

What components are necessary to install it?

Installation should always be done by a certified service technician. Correct installation is the only thing to ensure sufficient tightness in the frame and stretching of the membrane, and thus efficient filtration. Moreover, there are dozens of window frame types in different countries, and each one of them requires a slightly different procedure. Generally speaking, to install a nanofiber membrane, it is necessary to have a custom-made frame (usually made of aluminium profiles), rubber pad, sealing (e. g. polyethylene), inner angles, setting rails, stiffing of the border and springs.

Which side of the screen is oriented outside/inside?
The position of the membrane in the window does not affect its filtration efficiency – mechanical filtration works from both sides. In order to achieve maximum resistance, it is necessary to place the black side of the membrane outside and the silver side inside, though.

Is the airflow capacity different from inside to outside than outside to inside?
Similarly to the nanofiber filter, which works from both sides, the permeability and airflow is also identical on both sides.

Which part of the membrane does the air come through?
The air passes through the pores between individual fibers. The air molecule is small enough to pass through a nanofiber filter, while harmful particles have bigger diameter.

Is the material foldable?
For transportation and warehousing purposes, we highly recommend winding the nanofiber membrane to rolls without any folding. Folding, followed by loading the folded membrane, can damage the product irreversibly.

Is the membrane resistant to thermal stress?
Yes, the membrane remains stable even at great temperature variation and temperature changes throughout the year. The supporting net does not change its consistency up to temperatures above 340°C and the nanofiber filter up to temperatures above 380°C. However, we recommend not exposing the product to temperatures above 100°C in order to maintain its quality at 100%.

Can I choose from different colors?
Currently, the membrane is offered in one design only - grey from the outside and black for the inside

What does the packaging, in which the screen is sold, look like?
The product is supplied in the form of 1.5m wide rolls that are 35,5 and 70 m long according to the distributor's requirements. A roll of 1.5 m width and 0.9 and 1.3 m length is supplied to end-users.

Are there any limits concerning dimensions?
Currently, maximum width of the membrane in a roll is 1.5 m. This dimension is given by the width of the production machine. Regarding the length, the machine produces the membrane in the form of a virtually endless roll from which the indicated lengths are cut (0.9, 1.3, 35.5 and 70 m). In specific cases, it is possible to supply a different length of a roll.

How many windows can be covered with the amount of membrane included in the retail package?
The dimensions of the membrane wound on one roll are 0.9 x 1.5 metre, or 1.35 square metres. You can theoretically use one roll to secure 1-2 normal windows, depending on their size.

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Is it possible to use nanofiber window membrane for large areas?
Maximum width of the membrane is 1.5 m. This is rather limiting for larger areas, however, the membrane can be extended using a frame or welded with ultrasonic welding (which causes slight aesthetic degradation of the membrane).

Can I use brushes for washing?
Brushing is not recommended in any case as it may damage the membrane irreversibly. Please follow the instructions of use when cleaning the membrane.

Am I able to repair the damaged part of the screen by myself?
In the case of mechanical damage to the membrane, do not attempt to stick it or weld it by yourself. Always contact a service technician who will assess whether the damage can be repaired or whether it is necessary to replace the membrane to maintain its functionality.

3) Quality and Guarantee

Is there any certificate for this kind of product?
All RESPILON® products are tested and certified by independent institutions. The window membrane is proud holder of TÜV SÜD certificate (German test institute).

How do you measure permeability/filtration efficiency?
These parameters are tested both internally and by independent laboratories – mostly at the Engineering Test Institute in the Czech Republic. For the tests, the scientists use anemometers, pressure sensors and particle counters calibrated according to international standards.

What is the product guarantee?
During the time when the membrane is stored at the distributor, RESPILON Group s.r.o provides a 1-year product warranty. Once it is installed at the end user's, the warranty is based on the consumer protection according to the law of the given country (e.g. 2-year warranty in the European Union). During this period, RESPILON Group s.r.o guarantees 85% filtration of particles with dimensions of 2.5 micrometres (size of smog particles) and service life of the supporting net. Guarantee of the installation itself is took over by the service company that did it.

How do you control the quality of the production?
The production is performed in compliance with international standards and it is certified with ISO 9001:2008 and ISO 14001:2004. Each membrane batch is subject to internal quality test, which was developed in cooperation with independent scientists. This test assesses, among other things, whether filtration efficiency, permeability, lamination, layer adhesion and quality of the supporting net corresponds to the values declared.

What is the service life of the product?
The service life depends on concrete conditions – that is on the level of environmental pollution in the place where it is used.

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Where is the company located?
The headquarters of RESPILON is located in the Czech Republic, EU.

Where is the factory located?
Individual materials come from Asia and the product is finished in the Czech Republic. The production is subject to strict quality checks and the machines are operated by the best specialists in the nanofiber field.

Why is the price a bit higher in comparison with anti-dust screens?
Nanofiber technology is one of the youngest industry sectors and it uses unique processes and machines requiring precise setting and specialized operators. Given the innovativeness and the gradual increase of production capacities, the price of nanofiber products is higher than that of older and less effective commodity products manufactured with established and remarkably simpler methods.

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