



RESPILON

TM



Company introduction

Redspeare&Co was founded in Great Britain in March 2013.

Our mission is to **protect your health**. We hold the patent for the revolutionary nanofiber technology **Respilon™**. This unique filtration feature has been approved by world-renowned independent institutes. We are the only company in the world to mass-produce this nanofiber and systematically work on its further innovations and development.



A world map with two callout boxes. The first callout box, on the left, is connected to a location in London and contains the following text: **Redspeare&Co. LLP**, 207 Regent Street, London, United Kingdom. T: +44 845 004 5341, E: info@respilon.com, W: www.respilon.com. The second callout box, on the right, is connected to a location in Brno and contains the following text: **Headquarters for Europe**, Pražákova 1008/69, Brno, Czech Republic. T: +420 530 332 163, E: info@respilon.com, W: www.respilon.com. Below the map is a decorative pattern of overlapping circles.



Respilon™ introduction

Respilon history

At Redspere&Co., we've developed and market revolutionary nanofiber retail products to help people live a better life. The uniqueness of our products consists in Czech innovative nanofiber membrane **RESPILON™** which provides high filtration efficiency and can be used as a filtration media or barrier against various irritants. **RESPILON™** was developed after 20 years of research at the Czech Department of Nonwoven Textiles, Nano-science Centre, Faculty of Textile Engineering, Technical University of Liberec in the Czech Republic.

Patent

The **RESPILON®** membrane is a result of many years of European scientific research. It has a sandwich structure whose functional part consists of a nanofiber layer made of polyvinylidene fluoride (PVDF). This layer, without using any chemicals, creates a mechanical barrier that prevents the penetration of harmful particles through **RESPILON®**.



**RESPILON™ gives people
safer and healthier life
through its unique barrier features**

The unique properties of **RESPILON®** membrane were tested and verified in renowned laboratories such as EMPA (Switzerland), Czech University of Technology (Czech Republic) or Nelson Laboratories (USA). For each new product, we also develop a new modification of the membrane with the most suitable properties for specific applications. In our production facilities in the Czech Republic, we carefully monitor the quality of the nanofiber **RESPILON®** membrane to provide our customers with the best product.

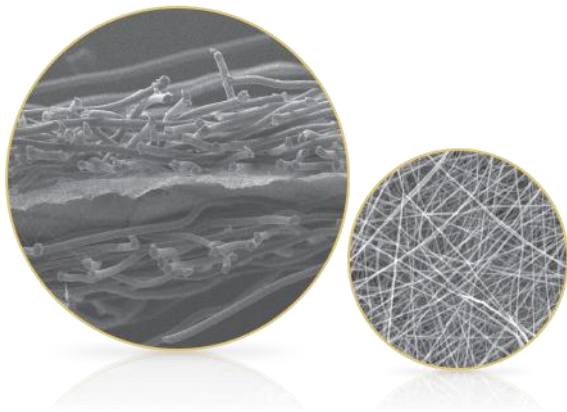
Redspere&Co has concluded an exclusive contract with the Technical University of Liberec (TUL) for the production of nanofiber, thus acquiring exclusive rights for sale. The ownership of the respective patents remains the property of TUL.



Nanofiber membrane

Introduction

The RESPILON® membrane is a dense network of fine fibers which, due to its structure, captures even the smallest dangerous particles. What does this mean in practice? Membrane pores are not penetrated by dust, smog or pollen, viruses or bacteria, mould or mites. All these harmful particles are simply too large to get through the nanofiber network. At the same time, perfect breathability enables easy breathing, e.g. when the membrane is used in the **ReSpimask®** facemask. Thanks to these properties, RESPILON® will protect you against diseases, allergies and pollution.



The result?

Unique filtering properties to protect your health against viruses, bacteria and allergens.

i Comparison of particle permeability. If the RESPILON® fabric let in particles of the size of a table tennis ball, common fabrics would not catch particles of size of the planet Earth.



table tennis ball

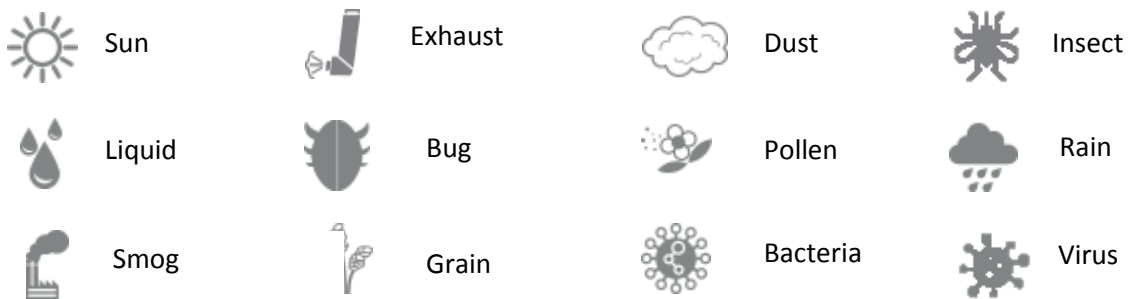


planet Earth

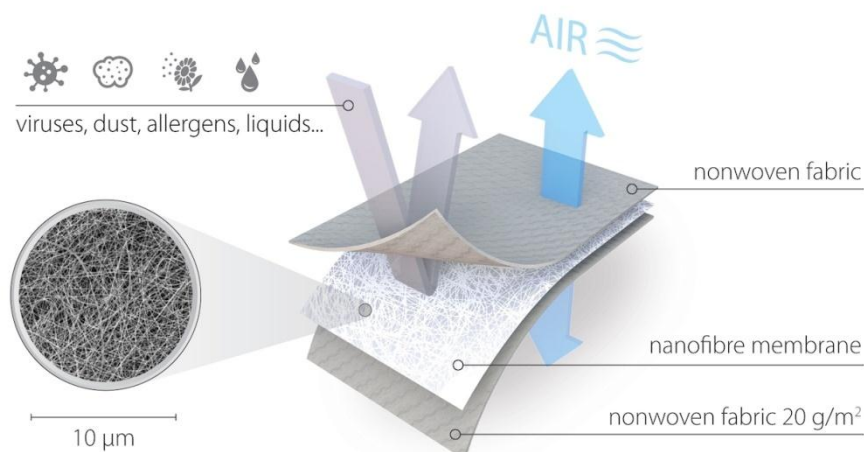
How does it work?

Nanomaterials are porous and “breathe”. On the other hand, the pore size is too small to let through any bacteria or viruses. Nanofiber fabrics therefore show excellent filtration efficiency even at a low pressure. This property predestines nanofibers to become the basis for so-called superfiltration media. These nanofibers will then find their place in filters for clean spaces of laboratories, surgical rooms and other spaces with the highest demands for air purified of bacteria and other micro-organisms or micro-particles.

The uniqueness of nanofibers consists in the technical barrier which protects the user against all harmful substances:



Competitive products use chemical barriers in the form of silver or carbon. Chemical treatment is effective but the wearer of such mask inhales products, which, as a result, does not contribute to their health. Respiratory masks made of the Respilon® nanofiber are harmless and protect the wearer against 99.9% of harmful substances in the air. Respiratory masks made of Respilon® are breathable, yet waterproof. How is this possible? A water molecule is larger than a molecule of air, which is the reason why the membrane is waterproof yet breathable.

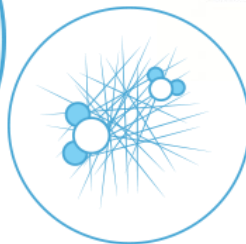
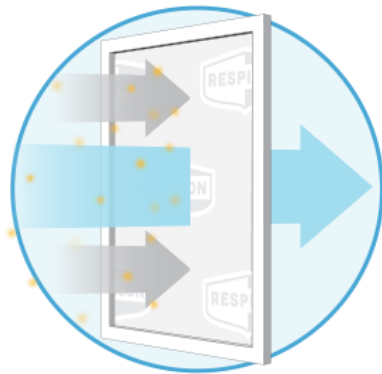




LIFE'S WORTH IT...

AIR®

RESPILON AIR® nanofiber membrane for windows and doors brings a whole new level of protection for your home. Forget screens that protect your home only against insects. RESPILON AIR® catches smog, pollen particles, dust, micro-organisms and rainwater. It thus contributes to a healthy and clean environment. Moreover, less dust settles in the house thanks to the membrane, so it is not necessary to clean as often.



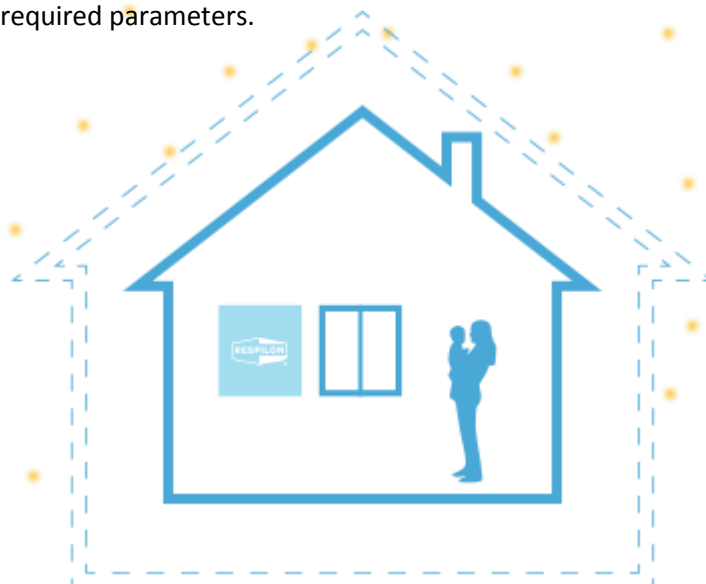
Air pollution kills over
2 million people
every year

07/2013 World Health Organization



In areas with intensive sunshine, RESPILON AIR® also works as a shade. When using a nanofiber membrane, your home can ventilate all day, yet not let in a single harmful particle. RESPILON AIR® also reliably prevents water from coming into the interior, so you don't have to close a window screened with the membrane even when it's raining. Yet the density of nanofibers protects your home against mites, pollen, viruses and bacteria all the time. This is why the membrane is the best solution for allergy sufferers.

A net featuring the unique nanofiber properties can also be used as a filtering device in various HVAC installations such as air conditioners or air purifiers. The shape and dimensions can be freely adapted according to the required parameters.

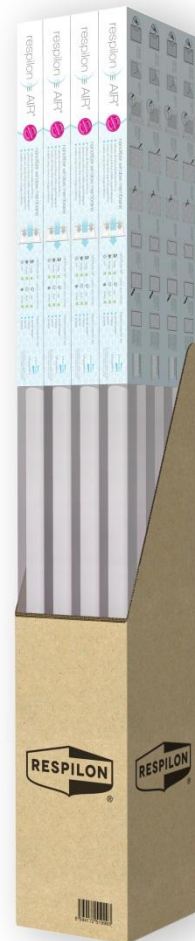




LIFE'S WORTH IT...



respilon AIR®





Technical Data Sheet Respilon Air®

The **Respilon AIR®** membrane is for installation into windows and ventilation systems, and its primary purpose is to form a barrier against pollen and air pollution. It is also able to stop the spread of mildew and bacterial spores, while being at the same time very permeable for air, gases and water vapors. Particles are caught mechanically. The membrane does not contain any chemical substances.

Respilon AIR® is a filtering material with an efficiency of PM 2.5 (the ability to filter 100% of particles with size of 2.5µm and less). Thus, the membrane is suitable for use in the households of allergic and asthmatic people, as well as people with cardiovascular disorders or pulmonary disease who live in areas or regions with high levels of air pollution.

The unique filtering ability of the membrane is provided by a nanofiber layer locked inside the membrane. Technically, the **Respilon AIR®** membrane is a three-layer laminate containing a non-woven fabric of spunbond type and a nanofiber layer. Fabric components used in the membrane are stabilized against UV radiation. The compactness of layers is ensured by material lamination.

Applications of the Respilon AIR® membrane

The membrane was developed for installation in windows to avoid the penetration of atmospheric particulate matter, pollen and mildew spores from the outside into interiors of houses, office buildings, flats and residential areas. The membrane can be used in:

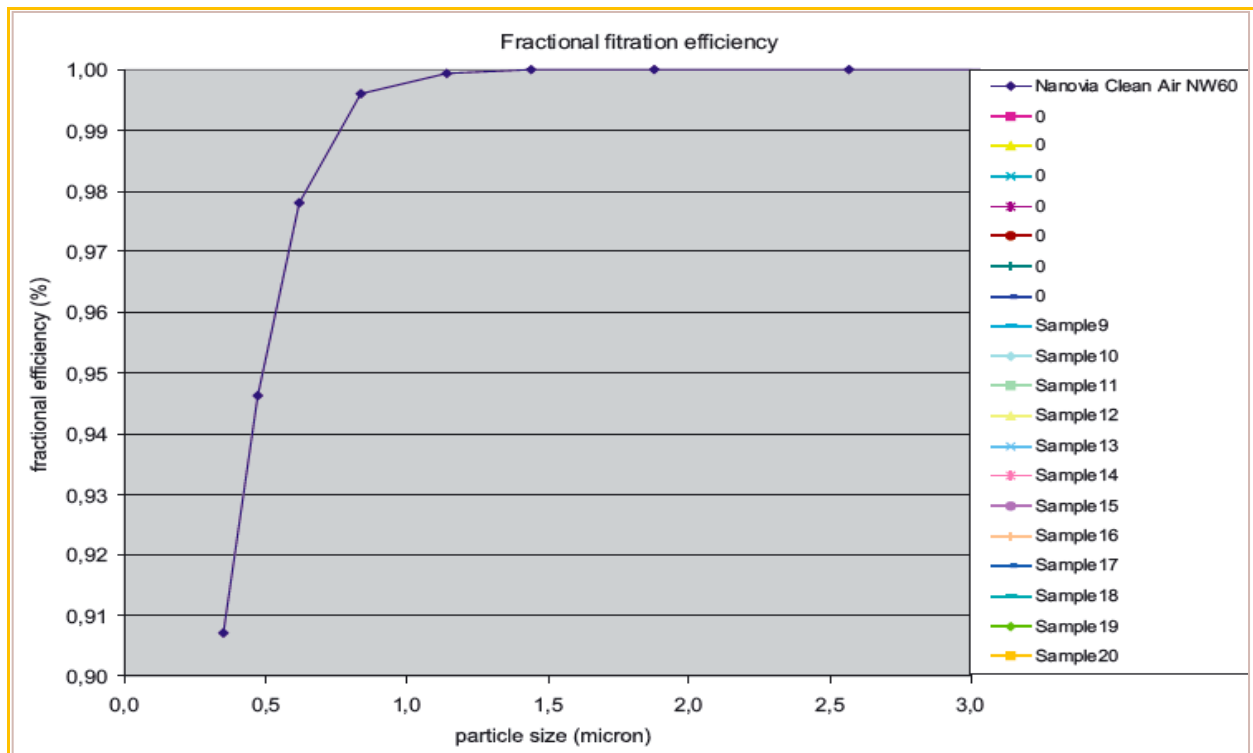
- fixed window barriers installed into window and door frames by a specialized company
- adhesive window barriers installed in window and door frames in household applications

Technical data for the Respilon AIR® membrane

Respilon AIR® NW 60			
Technical parameter	Value	UoM	Testing method
Surface density	60	g/m ²	EN 80 0845
Strength in longitudinal direction	160	N	EN ISO 13934-1
Filtering efficiency for particle size up to 2.5µm	100	%	EN ISO 22612
Filtering efficiency for particle size up to 1.0µm	99.9	%	EN ISO 22612
Flammability	No ignition	-	EN - 597-1 EN - 597-2
Light transmittance			
Permeability	330	l/m ² /s (200Pa)	EN 9237

Filtering efficiency of the Respilon AIR® membrane

The diagram of the fraction filtering efficiency of **Respilon AIR®** NW 60 shows that the material is able to catch 99.9% of dust particles with size of 1 micrometer — the bigger the diameter of dust particles, the better the efficiency of the material. Effective capture reaches 100% for particles with size of 2 micrometers and higher.



The blue curve represents the filtering efficiency of **Respilon AIR®** NW 60 laminate.

Respilon AIR® is available in rolls wound on a paper reel with 50mm diameter. The material is delivered in white color.

Width (cm)	Build on roll (lin. m)	Weight of roll (kg)
160	3 (linear meters)	0.45
160	150	16

Official documents

Redspeare&Co holds several certificates which guarantee the uniqueness of nanofiber the products in the company's product line are made of. The certificates were issued by well-known and recognized accredited laboratories, such as the Textile Testing Institute (TZU), Nelson Laboratories, Technical University of Liberec, etc. The documents are grouped according to their nature regarding tests, registrations, trademarks and patents.

Tests

Viral Filtration Efficiency



Flammability Test Report

Permeability Report




Report on Laboratory Toxicology Tests

Determination of the effectiveness of Respilon and other filter media against airborne particles



TZU – Nanofiber Flammability Test Report

TZU, Textile Testing Institute, is currently the testing and certification leader in the field. Respilon nanofiber was tested for flammability there. The positive results of the fiber's resistance are listed in the report issued in accordance with valid accreditation by the Textile Testing Institute.



Textilní zkušební ústav
Václavská 6, 658 41 Brno, Česká republika

Akreditovaná zkušební laboratoř č. 1001

PROTOKOL O ZKOUŠKÁCH

FZZ 13 / 0150

ZADAVATEL : Navia s.r.o.
Vaníkova 95
269 01 Rakovník

VZOREK : RESPILON
(dle údajů zadavatele)

PŘEDMĚT ZKOUŠENÍ : Hořlavost – Zhnoucí cigareta a ekvivalent plamene zápalky



**PODMÍNKY POUŽITÍ
PROTOKOLU :** Protokol obsahuje výsledky zkoušek, které se vztahují jen k předloženému vzorku. Odběr vzorků proveden zadavatelem. Protokol nesmí být reprodukován jinak než celý. K reprodukování části protokolu si musí zákazník vyžádat souhlas zkušebny, která protokol vystavila. Pokud protokol obsahuje zkoušky zajištěné na základě subdodávky nebo neakreditované zkoušky, je toto v protokole uvedeno.


PROTOKOL VYSTAVIL : Čermáková *Čermáková*
PŘEKontroloval : Tichá *Tichá*
POČET STRAN : 2

**DATUM PŘIJETÍ
ZAKÁZKY :** 13.02.2013

**DATUM PROVEDENÍ
ZKOUŠEK :** 02.-08.03.2013

**DATUM VYSTAVENÍ
PROTOKOLU :** 11.03.2013





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☎ +420 543 426 742
🌐 <http://www.tzu.cz>
✉ fzz@tzu.cz



Textilní zkušební ústav

Protokol č. FZZ 13 / 0150
strana : 2

METODIKA HODNOCENÍ

Hodnocení zápalnosti matrací a lůžek s pevným čalouněním

Část 1 : Zdroj zapálení - žhnoucí cigareta

Zkušební metoda : ČSN EN 597-1 (91 0236)

Podmínky zkoušení : Zkušební ovzduší : relativní vlhkost 52%, teplota 23°C

Rozměry testovacího rámu : sedák 450 x 150 mm, opěradlo 450 x 300 mm

Zkoušené materiály : testovaný vzorek podložený PUR pěnou CF 2830

Počet zkoušek : 2

Klimatizace vzorků : relativní vlhkost (50 ± 5)%, teplota (23 ± 2)°C

Hodnocení zápalnosti matrací a lůžek s pevným čalouněním

Část 2 : Zdroj zapálení - ekvivalent plamene zápalky

Zkušební metoda : ČSN EN 597-2 (91 0236)

Podmínky zkoušení : Zkušební ovzduší : relativní vlhkost 52%, teplota 23°C

Rozměry testovacího rámu : sedák 450 x 150 mm, opěradlo 450 x 300 mm

Zkoušené materiály : testovaný vzorek podložený PUR pěnou CF 2830

Doba zapalování : (15 ± 1) s

Počet zkoušek : 2

Klimatizace vzorků : relativní vlhkost (50 ± 5)%, teplota (23 ± 2)°C

VÝSLEDKY ZKOUŠEK

Navia RESPILON			
Vlastnost	zkušební metoda	měřicí jednotka	zjištěné hodnoty
Hořlavost ³⁾			
• cigaretový test	ČSN EN 597-1,2 (91 0236)	-	bez zapálení
• zápalkový test		-	bez zapálení

³⁾ V průběhu zkoušky vzorek nehořel ani progresivně nedoutnal.

Uvedené výsledky zkoušek se vztahují pouze na zápalnost kombinací materiálů za konkrétních podmínek zkoušky; neslouží k posouzení všech možných rizik vedoucích v praxi ke vzniku požáru matrací, šabrák a lůžek s pevným čalouněním.


Vladimír Štokr
vedoucí fyzikální zkušebny





Nelson Laboratories – Viral Filtration Efficiency

Nelson Laboratories is a leading provider of full, life-cycle microbiology testing services for the Medical Devices, Pharmaceutical, Tissue and Natural Products industries. This laboratory carries out more than 400 various tests and examinations, providing comprehensive services in the field of

Sponsor:
Roman Zima
Krkonoska 5
Prague CZ 120 00
CZECH REPUBLIC

Viral Filtration Efficiency (VFE) Final Report

Test Article: RESPILON
 Purchase Order: NTPO-2013-012
 Laboratory Number: 668801
 Study Received Date: 21 Apr 2013
 Test Procedure(s): Standard Test Protocol (STP) Number: STP0007 Rev 07

Summary: The VFE test is performed to determine the filtration efficiency by comparing the viral control counts to test article effluent counts. A suspension of bacteriophage ΦX174 was aerosolized using a nebulizer and delivered to the test article at a constant flow rate. The aerosol droplets were drawn through a six-stage, viable particle, Andersen sampler for collection. This method allows a reproducible challenge to be delivered to the test articles. The VFE test procedure was adapted from ASTM F2101. All test method acceptance criteria were met.

Area Tested: ~45.6 cm²
 VFE Flow Rate: 28.3 Liters per minute (L/min)

Results:

Test Article Number	Percent VFE (%)
1	>99.9 ^a
2	>99.9 ^a
3	99.9
4	99.9
5	>99.9 ^a

Note: Plate count totals for each stage are available upon request.
^a There were no detected plaques on any of the Andersen sampler plates for this test article.

Mean Positive Control Count: 1,826 plaque forming units (PFU)
 Negative Control Count: <1 PFU
 Mean Particle Size (MPS): 0.1 μm

Study Director

Sarah Smit, B.S.

21 May 2013
Study Completion Date

P.O. Box 571830 | Murray, UT 84157-1830 U.S.A. - 6280 South Redwood Road | Salt Lake City, UT 84123-6600 U.S.A.
 www.nelsonlabs.com - Telephone 801 290 7500 - Fax 801 290 7998 - sales@nelsonlabs.com

bj FRT0007-0001 Rev 7
 Page 1 of 1

These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety. Subject to NLI terms and conditions at www.nelsonlabs.com.

laboratory testing.

Technical University of Liberec

Technical University of Liberec provides facilities for the performance of tests of fabrics in a specialized center at the Department of Textile Evaluation. The tests are performed on the basis of the institution's valid accreditation, in accordance with all standards.



**TECHNICKÁ UNIVERZITA
V LIBERCI**
Fakulta textilního Inženýrství
Katedra hodnocení textilií
Studentská 2, 46117 Liberec
Česká Republika
DIČ CZ 4674 4884, IČO 4674 4884



**PROTOKOL O VÝSLEDČÍCH MĚŘENÍ PAROPROPUSTNOSTI TEXTILNÍCH
LAMINÁTŮ S NANOVLÁLENNOU VRSTVOU A MIKROVLÁKENNÉ TEXTILIE
ZE DNE 29.2.2012**

**Klient: Roman Zima, Krkonošská 1511/5, 120 00 PRAHA
IČ 68400004**

Objednávka č. NTPO – 2012-007

Měřicí metoda a přístroj: dle modifikované ISO 11092 (0,5 dm², 23°C, RH 40%)

Počet měření: 3 z každého vzorku, výpočet průměru a variačního koeficientu


Sample	evaporative resistance Ret (m ² Pa/W)	CV (%)	Relative vapor- permeability P (%)	CV (%)
Anti Bacteria	1,0	13,0	85,3	2,0
Anti Allergy	1,5	14,9	79,6	2,9
Stop Bacteria	1,3	15,6	82,0	2,7
RESPILON	2,0	4,2	74,1	1,2
EVO 100	1,8	11,5	76,2	2,8
Evo 100 PS	1,7	13,9	76,9	3,3
EVO 100 SO	2,0	7,3	74,2	1,9
EVO 100 PS SO	2,0	17,2	74,4	4,4
Pristine	2,4	7,3	67,2	2,6



Vypracoval: Prof. Ing. Luboš Hes, DrSc

Český zástupce v CEN/TC 248/WG 28
Standardisation Committee on Thermoregulatory Properties of Fabrics

Český zástupce v ISO TC 38, WG38, WG 17
SC on Thermophysiological Properties of Fabrics

The National Institute of Public Health – Report on Laboratory Toxicology Tests

 **Státní zdravotní ústav**
Centrum laboratorních činností
Laboratoře toxikologie
Šrobárova 48, 100 42 Praha 10
Tel.: +420 267082439 Fax: +420 267082386 E-mail: jirova@szu.cz

Zkušební laboratoř č. 1206, akreditovaná ČIA

Protokol o výsledku laboratorních zkoušek č.3/13/8

Zadávatel: **NANOVIA s.r.o.**
Adresa: Vanšůvkova 2095, 209 01 Rakovník II
Referenční číslo: CTZB 187-46/2013

Vzorek


Název:
VZ 3/13/8: Nanovia AntiVirus

Vyšetření

SOP č.2/3 Zkoušky na dráždivost a přecitlivělost oddáleného typu (ČSN EN ISO 10993-10:
Část 10: články 1, 2, 3, 4, 5, 6.2, 6.3, 6.4, 6.5, 7.5, Příloha A, B.1, B.2, C, E, F)

Datum přijetí expertízy: 18.1.2013
Datum vyhotovení protokolu: 6.3.2013
Celkový počet stran: 8

Vypracoval: RNDr. Hana Bendová, Ph.D.
Technický vedoucí: MUDr. Dagmar Jírová, CSc.



Výsledky zkoušek se týkají pouze předmětu zkoušky a tento protokol o zkoušce nenahrazuje jiné dokumenty ani schválení výrobku. Bez písemného souhlasu zkušební laboratoře se nesmí protokol reprodukovat jinak než celý.

3/13/8 – 1/8

Respilon PM2.5, 7,617 for Pegatex 60gsm, 8,962 for Pegatex 35gsm, and 9,727 for Pegatex S. It is known that the nanofiber media shift the most penetrating particle size (MPPS) to smaller sizes. The data show that the MPPS is about 70 – 90 nm for Respilon H11 and PM2.5 and is about 100 nm for Respilon 57. Please see Table 2 for the MPPS and corresponding efficiencies. In contrast, the MPPS is in the range of 150 – 500 nm for the Pegatex media. The filtration performance of filters is evaluated in terms of the figure of merit. Respilon H11 shows the highest figure of merit among the available test data presented here. The three Respilon media all show higher figure of merit than Pegatex 60gsm and 35gsm in the particle size range larger than the MPPS of the Respilon media.

Table 2. The approximate MPPS size and corresponding efficiencies of the samples.

Sample	MPPS size (nm)	Efficiency at the MPPS
Respilon H11	~ 70 – 90	~ 80.5%
Respilon 57	~ 100	~ 70.4%
Respilon PM2.5	~ 70 – 90	~ 39.1%
Pegatex 60gsm	~ 335	~ 12.8%
Pegatex 35gsm	~ 500	~ 14.3%
Pegatex S	~ 150	~ 10.7%

5. Approver

Name	Title	Signature	Date
Jing WANG	Assistant Professor, ETHZ/EMPA	<i>Jing Wang</i>	25.03.2014



LIFE'S WORTH IT...

Registration

Registrations with the Ministry of Health and the Industrial Property Office:



Notification about fulfillment of announcement obligation

Ownership report



Ministry of Health of the Czech Republic



Redspeare&Co. LLP
Krkonošská 1511/5, 120 00 Praha 2

In Prague, January 25th 2013 Reference number: MZDR 49/2013

Subject: Notification about fulfillment of announcement obligation

Czech Ministry of Health is notifying, that is received in conformity with provisions §31 of Act 123/2000 Coll. Regarding the medical devices and about the changes of related Acts, as amended, your posted forms in accordance with annex Nr. 15 to Government Regulation Nr. 336/2004 Coll., as amended and considers your obligation to notify as accomplished.

Ministry of Health also assigns registration code to your product as follows:

Identification of the product:

Registration code:

Antivirus protective face mask
ReSpimask

MZDRX00IRGN4


Quote the code assigned to the product with every amendment concerning this product (canceling production)

Best regards

Mgr. Jakub Kral, m.p.
Head of the Medical Devices Department





Ministerstvo zdravotnictví ČR, odbor farmacie Palackého náměstí 4, 128 01 Praha 2, tel.: +420 224972611, e-mail: far@mzcr.cz, www.mzcr.cz Vyřizuje: Miroslava Porazíková tel.: +420 224 972 507, e-mail: miroslava.porazikova@mzcr.cz


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Industrial Property Office
of the Czech Republic
Úřad průmyslového
vlastnictví
Antonína Čermáka 2a
CZ-160 68 Praha 6
République tchèque

9 


UPV201300043102

BRAUNSTEIN

12 Septembre 2013

AVIS CONCERNANT UNE DEMANDE INTERNATIONALE

ATTENTION:

La ou les irrégularités mentionnée(s) dans cet avis doivent être corrigée(s) par l'Office d'origine. Toutefois, l'irrégularité concernant les émoluments et taxes peut être corrigée, soit par le déposant, soit par l'Office d'origine.

Ré.: Demande internationale fondée sur
la demande N° 499399
- pour la marque **ReSpimask NANO FIBER**
- au nom de **Zima Roman**

Date de réception de la demande internationale
- par l'Office d'origine: 30 Avril 2013
- par le Bureau international: 27 Juin 2013

Notre réf.: EN-I/746947201/GI
Réf. de l'Office: 504324
Réf. du déposant:
Examineur: Gonca ILICALI
Téléphone N°: + 4122 338 7501
E-mail: intreg.mail@wipo.int

Nous accusons réception de la demande internationale

WORLD INTELLECTUAL PROPERTY ORGANIZATION

34, chemin des Colombettes
1211 Geneva 20, Switzerland
www.wipo.int