The A

to

Panasonic



The A to Z of nanoe $^{\scriptscriptstyle\mathsf{TM}}$ Technology

— All about its effects and evidence —





The A to Z of nanoeTM Technology

— All about its effects and evidence —

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<Purpose of this book>

nanoeTM Technology is Panasonic's superior proprietary technology. However, as nanoeTM Technology is a technology that involves minute ions not visible to the naked eye and obtains its effect through a chemical reaction by OH radicals, it is difficult for customers to understand its effect.

In order to enhance the objectivity and credibility of the nanoeTM Technology benefits and effectively make them known widely, verification tests were conducted by third-party organisations regarding specific effects, such as inhibiting bacteria & viruses and deodorisation.

This book is a complete edition that contains all of the evidence that currently has been obtained (as of March, 2019) from the verification by third-party organizations. When using excerpts from this book in promotional materials or the like, please check beforehand with your legal department to ensure that they do not violate any laws or regulations in the relevant country. In particular, proper attention needs to be paid to the names of viruses, bacteria, and diseases.

Publishor

Product Planning / A&P Section
Residential Air-Conditioning & A2W Department
Heating and Cooling Solutions Marketing Center
Consumer Marketing Division

Consumer Marketing Division
Appliances Company

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nanoe™ Technology



nanoe Technology is Panasonic's unique technology which involves its special expertise at the nanometer level. It deodorises, inhibits the growth of bacteria and viruses; and is effective in dust removal for a fresher and cleaner indoor environment.

"nanoe™ Technology" is a general term which refers to one, two, or all of three different types of nanoe™ devices (nanoe™X, nanoe™, and nanoe-G) either separately or in any combination.







INDEX

1.	What is nanoe™ Technology?	
2.	What are nanoe™ X and nanoe™? ····································	2
3.	Effects of nanoe [®] X ·····	32
4.	Effects of nanoe [™] ······	4
5.	Effects of nanoe-G	62
6.	Compilation of supporting evidence	
	1) nanoe™ X and nanoe™ evidence ······	6
	Representative evidence	
	Further evidence	
	2) nanoe-G evidence ·····	8
	3) Verification of major characteristics of nanoe™ X and nanoe™	8
7.	Test reports overview - relevant certificates and cover pages	8

Vhat is nanoe™ Technology ?

What are nanoe™ X and

Effects of

Effects of

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

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Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Older O Is also



What is nanoe[™] Technology? What is nanoe™ Technology?

Odours

Bacteria & viruses

Hazardous substances (PM2.5)

Dust (PM2.5)



Panasonic's patented ion technology: nanoe™ Technology.

Improving air quality, Enriching people's lives. Nano-sized charged water particles: "nanoe™".

The "charged water particle generation technology" developed by Panasonic is a technology that collects invisible moisture in the air and applies high voltage to it to produce nano-sized water particles.

These water particles are called "charged water particles" because they carry an electric charge.

The water particles contain OH radicals (highly reactive components) that act easily on a variety of substances, achieving deodorisation and the inhibition of viruses and bacteria.

OH radicals (highly reactive components) are generally described as easily denatured through their binding to various substances in the air and as not lasting long. However, it was also verified that the OH radicals generated by "charged water particle generation technology" have a long life because they are surrounded by water, and this makes their effects far-reaching.

Panasonic has patented these "charged water particles," naming them "nanoe™".

Number of patent applications for "nanoe" devices and products equipped with them: Approx. 850 (as of November 1, 2018)



The origin of the name "nanoe™"

The name comes from a combination of "nano" from "nano-technology" and "e" from the word "electric."



An image of nano-size

1nm = 0.00000001m

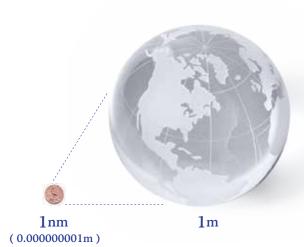
1nm is one billionth of one metre.

If the size of the Earth were 1m,

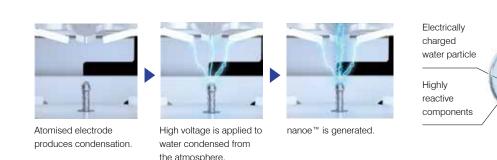
1nm would be about the same size as a US dime.

The size of "nanoe™" particles is 5-20nm.

These small particles have a big effect.



Steps in "nanoe™" generation



*The generation principle for nanoe-G is different. (Refer to page 18-19)

What is nanoe™ Technology ?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

Approx.

5 - 20nm

substances (PM2.5)

> Dust (PM2.5)



Verification of nanoe[™] has been car ried out in collaboration with research institutes around the world.

Virus clearance test conducted to verify the virus inhibition effect of nanoe[™] Technology.

~Effect expected on highly-resistant viruses and unknown viruses~

Joint verification



GLP (Good Laboratory Practice) qualified facility Charles River Biopharmaceutical Services GmbH (Germany)

Test outline

Four types of viruses were selected based on the Virus Clearance Test Guidelines, and a comparison of nanoe™ exposure and non-exposure was carried out in testing according to GLP standards.

Testing organisation: Charles River Biopharmaceutical Services GmbH

A facility of the Charles River Laboratories Group, a global company that supports drug development from the pre-clinical to post-market stages as a subcontractor entrusted with the breeding/supply of high-quality laboratory animals and various safety tests.

GLP (Good Laboratory Practice): Standards to show that testing was carried out accurately and properly, with strict provisions for testing procedures, etc.

Test period: September-November 2011

■Test subjects: • Xenotropic murine leukemia virus

Encephalomyocarditis virus

Pseudororabies virus

Porcine parvovirus

■Test method: • Test space volume: 45L box

Exposure time: 3hours, 6hours

• Exposure distance: 15 cm



Verification results

Virus infectivity for the four kinds of viruses was reduced by 99% in 6 hours.

<Opinion of Charles River Biopharmaceutical Services GmbH>

nanoe™ shows it has promise for inactivation overall and to a considerable degree with respect to a wide range of biologically different human- and animal-derived viruses. The same can be considered for highly-resistant viruses and unknown viruses.

A collaboration with Harvard University has enabled visualisation of nanoe[™] bacterial inhibition mechanisms.

~Confirmation of significant damage to cell membranes in Serratia bacteria in morphological observation using an electron microscope~

Joint verification



Harvard University Harvard School of Public Health Laboratory for Environmental Health NanoSciences (USA)

Test outline

Verification of inhibition effect and morphological change was carried out with respect to Serratia marcescens using exposure to nanoe™ charged water particles.

 Verification partner: Harvard School of Public Health Laboratory for Environmental Health NanoSciences

> Laboratory for Environmental Health NanoSciences: A laboratory at the Nanotechnology and Nanotoxicology Center at the Harvard School of Public Health.

Test period: August-October 2011

Verification subject: Serratia marcescens

Serratia marcescens: It exists in the natural world and in the intestines of animals and people. Although being of low pathogenicity, it does cause hospital infections and opportunistic infections.

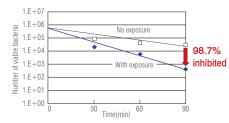
●Test method: In a 45L box, a stainless-steel plate with drops of a Serratia marcescens solution was exposed to nanoe™ charged water particles. After the test. Serratia bacteria were extracted and cultured to measure the number of viable bacteria. Serratia bacteria with 90 minutes of exposure and no exposure were processed for transmission electron microscopy, and morphological changes verified.

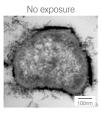
Verification results

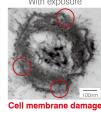
Serratia marcescens, a kind of bacterium, was inhibited by 98.7% in 90 minutes.

< Commentary from the Laboratory for Environmental Health NanoSciences at the Harvard University School of Public Health> nanoe™ was found to damage the cell walls and cell membranes of Serratia marcescens, and to also have an inhibition effect. We anticipate progress in future joint research on applications for nanoe™

in the air-quality and foodstuffs industries and the field of hospitalinfection prevention.







What are nanoe™ X and nanoe™? Effects of nanoe™ X Effects of nanoe1 Effects of nanoe-G Compilation of supporting evidence Test reports Bacteria & viruses Mould

Hazardous

substances

(PM2.5)

Dust

(PM2.5)



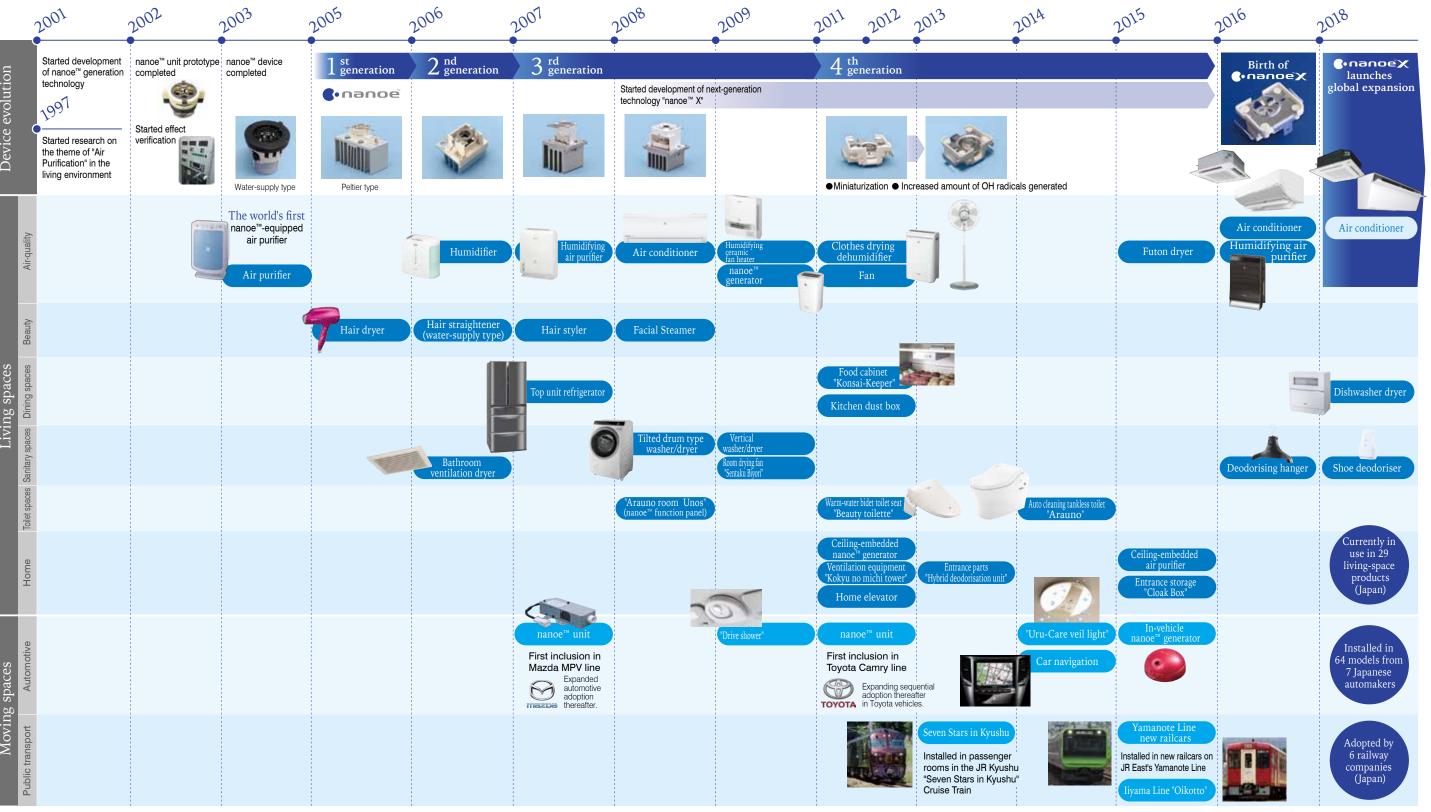
The results of verifying the effect of nanoe™ Technology have been reported worldwide.



What are Effects of Effects of Effects of nanoe-G Compilation of supporting Bacteria & viruses Hazardous (PM2.5) Dust (PM2.5)



Research into nanoe™ Technology began more than 20 years ago.





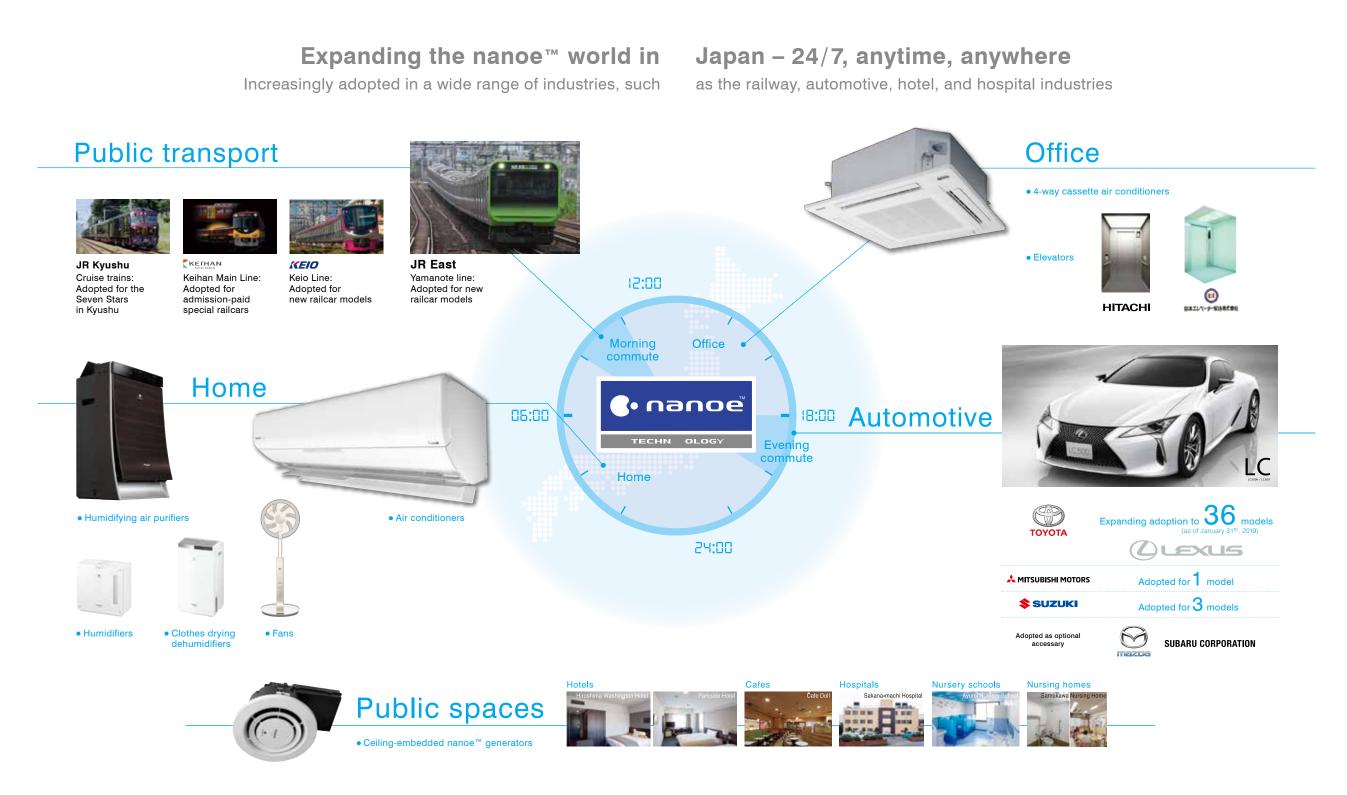
Hazardous

substances (PM2.5)

(PM2.5)



Use of nanoe™ Technology has spread to various fields around Japan.



What is nance Technology?

What are nance X and nance X and nance X

Effects of nance X

Effects of nance M

Compilation of supporting evidence

Test reports

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair



The effects of nanoe™ Technology are recognised by experts in each field.

Recommended for use in facilities such as medical institutions where greater cleanliness is required.

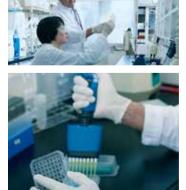


Veterinary Infectious Disease Studies
Professor Masafumi Mukamoto

Osaka Prefecture University



Various types of moulds enter houses along with people and air. Even if preventive action is taken in our everyday lives, it is often very difficult to inhibit the growth of mould, especially in humid environments. With nanoe $^{\text{TM}}$ X, we have experimental results*1 that show we can inhibit the growth of the types of mould commonly found in various places in the house. As nanoe $^{\text{TM}}$ X is also capable of inhibiting invisible bacteria and viruses that exist in our living environment, we can expect it will deliver a clean environment. I recommend that equipment incorporating nanoe $^{\text{TM}}$ X technology be placed in buildings where cleanliness is required, such as in schools, childcare facilities and medical institutions.**













Hope for the creation of more comfortable spaces for those who have problems with asthma or atopic dermatitis.



Azabu University School of Veterinary Medicine Department of Veterinary Medicine Professor Masahiro Sakaguchi



We have experimental results that show nanoe $^{\text{\tiny TM}}$ X is capable of inhibiting allergens that could induce asthma or atopy.

Recently asthma patients are on the increase,*2 and it is important to take precautions against the allergens that we inadvertently inhale in our daily lives. As nanoeTM X is effective in inhibiting invisible allergens, we can expect it will create a comfortable environment for people who suffer from asthma and atopy. As the safety of nanoeTM X has also been verified, nanoeTM X gives peace of mind to families with small children.**

*2 World Health Organization, Bronchial asthma: http://www.who.int/mediacentre/factsheets/fs206/en

Technology?

What are nance™ X and nance™?

Effects of nance™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)

^{*1} Experimental results show that nanoe™ X is effective in inhibiting the growth of the following types of mould commonly found in homes Cladosporium, Aspergillus, Penicillium, Alternaria, Fusarium, Eurotium, Mucor, and Stachybotrys.

^{**} The above indications and statements are made in reference to available information



The difference between nanoe[™] X, nanoe[™], and nanoe-G.

	6 •nanoe [™] X	C•nanoe ™	G •nanoe-g		
Main components & size (Conceptual diagram)	Water particle OH radicals (Highly reactive components) Approx. 5 - 20nm (Water ion)	Water particle OH radicals (Highly reactive components) Approx. 5 - 20nm (Water ion)	Oxygen molecule Negative ions Approx. 1 - 2nm (Air ion)		
OH radicals	4.8 trillion OH radicals / sec	480 billion OH radicals / sec	3 trillion negative ions / sec		
Generating mechanism	Counter electrode Atomisation electrode Generating area for OH radicals: Large	Counter electrode Atomisation electrode Generating area for OH radicals: Small	Counter electrode Atomisation electrode Generating area		
Discharge system	Electrostatic atomisation (Multi-leader discharge)				
Generating principle	The moisture in the air is condensed and concentrated at one point, and nance™ X is generated by applying a high voltage (via multi-leader discharge). nance™ X contains 10 times more OH radicals than nance™.	The moisture in the air is condensed, concentrated, and radially dispersed, and nanoe™ is generated by applying a high voltage (via corona discharge).	Natural ion wind spreads nanoe-G negative ions that are released from the nanoe-G generator.		
Deodorises					
Inhibits growth of bacteria & viruses			(Collects dust particles)		
Dust removal (PM2.5)	×	×			
	: Very effective : Effective	▲: Moderate X: Not effective			

What is nanoe™
Technology?

What are
nanoe™ X and
nanoe™?

Effects of
nanoe™ X

Compilation of supporting evidence

Effects of nanoe-G

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

The safety of nanoe™ X & nanoe™ has been verified.

nanoe[™] **X & nanoe**[™] are microscopic ions enveloped in water. Made from naturally existing moisture, they are totally safe. Below are verified safety testing data.

Test purpose	Test name	Testing organisation				
Impact on chromosomes	Chromosome abnormality test using cultured cells	Japan Bioassay Research Center < GLP*1 (Good Laboratory Practice) qualified facility >				
Impact on respiratory organs	Repeated administration toxicity test	Life Science Research Laboratory (Institution registered with the Cause Investigation Institution Network*2)				
Toxicological and carcinogenic impact	Chronic toxicity and carcinogenicity combined test	Food and Drug Safety Center Hatano Research Institute < GLP*1 (Good Laboratory Practice) qualified facility >				
Impact on DNA	Comet Assay	Food and Drug Safety Center Hatano Research Institute < GLP*1 (Good Laboratory Practice) qualified facility >				
Impact on male and female fertility and on next-generation children	Simplified reproductive toxicity test	Food and Drug Safety Center Hatano Research Institute < GLP*1 (Good Laboratory Practice) qualified facility >				

^{*1} GLP aims to secure reliability of various safety test results on chemical substances, and confirms compliance with the GLP standard by testing institutions and ensures reliability of test results.



What is nanoe™
Technology?

What are
nanoe™ X and
nanoe™?

Effects of
nanoe™ X

Effects of
nanoe™

Test reports

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances

(PM2.5)

(PM2.5)

Skin & hair

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection. Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated.

^{*2} The Cause Investigation Institution Network is a network administered by the National Institute of Technology and Evaluation, the independent administrative agency of the Ministry of Economy, Trade and Industry.

^{*} The generation principle for nanoe-G is different. (Refer to page 18-19)

What are nanoeTM X and nanoeTM ?

What are nanoe™ X and nanoe™ ?

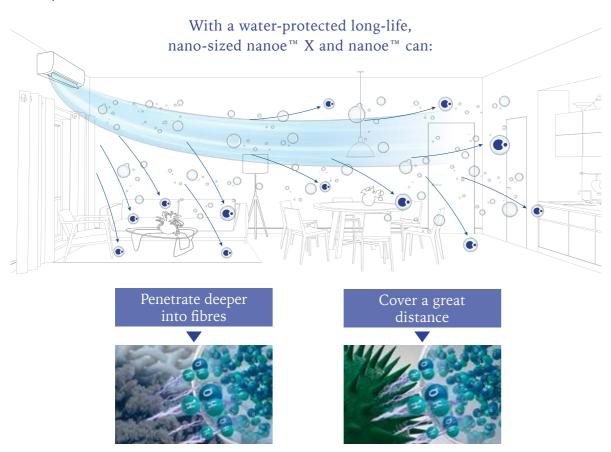
Hazardous substances (PM2.5)

Dust (PM2.5)

nanoe™ X and nanoe™ prove effective in eliminating odours, in as well as in inhibiting bacteria wiruses, mould and allergens.

<Not a result of experiments in actual use environments>

Freshens and cleans the air, which contains allergens such as pollen, as well as viruses, bacteria, and unpleasant odours which lurk in household rooms. Also contributes to healthier skin and hair.



Act directly on the sources of risks deep in fibres or in the air

- *1 <Cigarette smoke odour> <nanoe ** X> [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe w released [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 2.4 levels in 12mins (4AA33-160615-N04) < nanoe™ > [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 1.2 levels in 2 hours (BAA33-130125-D01)
- *2 <Airborne bacteria > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of bacteria is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne bacteria [Test result] Inhibited by at least 99.7% in 4 hours (24_0301_1) < Adhered bacteria > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method]] The number of bacteria is measured after direct exposure in an approximately 1m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 24 hours (20 0154 2) Each test was conducted using a single type of bacteria
- *3 <Airborne virus > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of virus is measured after direct exposure in an approximately 25m sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne virus [Test result] Inhibited by at least 99.7% in 6 hours (24_0300_1) < Adhered virus > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method]] The number of virus is measured after direct exposure in an approximately 1m3 sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered virus [Test result] Inhibited by at least 99.9% in 2 hours (21_0084_1) Each test was conducted using a single type of virus
- *4 <Airborne mould> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of mould altered in an approximately 23m³ sized test room [Inhibition method] nance™ released [Test substance] Airborne mould [Test result] Inhibited by at least 99% in 1 hour (205061541-001) <Adhered mould> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured mould adhered to a cloth in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Adhered mould [Test result] Inhibition effect is confirmed in 8 hours (18077411001-0201) Each test was conducted using a single type of mould
- *5 <nanoe™ X> [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nance™ released [Test substance] Allergens (Dermatophagoides pteronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander) [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-160615-F01, 4AA33-170301-F15, 4AA33-151001-F01, 4AA33-151028-F01, 4AA-33-160601-F01, 4AA33-160601-F02 4AA33-160701-F01, 1V332-180301-F01, 4AA33-160615-F02, 4AA33-160615-F03, 4AA33-160620-F01)



<nanoe ** > <Dog-derived allergens and cat-derived allergens> [Testing organisation] Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] dog derived allergens, cat derived allergens [Test result] <Dog (dander)> Inhibited by at least 99% in 1 hour (11M-RPTAPR047_1) < Cat (dander) > Inhibited by at least 98% in 2 hours (11M-RPTAPR051_1) < Mite faeces/carcasses = [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Attached mite allergens [Test result] Inhibited by at least 60% in 24 hours (BAA33-130304-F04) < Mould-derived allergens> [Testing organisation] Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] Mould-derived allergens [Test result] Inhibited by at least 93% in 2 hours (11M-RPTMAR076 1) < Pollen > Cedar [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m3 sized test room [Inhibition method] nanoe "released [Test substance] Cedar pollen [Test result] Inhibited by at least 88% in 8 hours (BAA33-130304-F01) Cypress, Orchard grass, Ragweed [Testing organisation] Panasonic Product Analysis

C•nanoe
✓ C•nanoe

**6 <Skin> <nanoe™ X> [Testing organisation] Panasonic Product Analysis Center [Testing method] Rest period: 90 minutes, nanoe™ exposure time: 60 minutes, retention: 60 minutes. 8 women aged 30~49 with dry to normal skin. [Test result] Change in skin moisture content equivalent to a 20 percentage point increase from 30% --> 50% in environmental humidity (USG-KT-14K-012-TM) <nanoe **> Testing organisation] Panasonic Product Analysis Center [Testing method & test result] Approximately 34m3 sized test room, room temperature 23 degrees Celsius, humidity 30%. 8 women aged 30~49 with varying skin conditions ranging from being averagely moist to dry, the stratum corneum water content was measured before and after resting for 90 minutes being exposed to a nanoe™ generating device, to find the average value of the change. (D01-071219F-01)

< Hair> [Testing organisation] Panasonic Product Analysis Center [Testing method] Approximately 46m³ sized test room, room temperature 25 degrees Celsius, humidity 40%. Bundles (6 bundles) of hair were suspended 2m from a nanoe™ generating device, with repeated operation of the nanoe™ generating device: 8 hours on and 16 hours off. [Method] nance™ released [Test substance] Hair [Test result] < nance™ X> (USD-KS-15S-009-TM), < nance™ > (D01-091005-01TM)

Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe "released [Test substance] Cypress pollen,

Orchard grass pollen, Ragweed pollen [Test result] Inhibiting effect was confirmed in 24 hours (1V332-171010-F04, 1V332-171010-F02, 1V332-171010-F01)

Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated. Results may vary based on usage and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection Individual results may vary based on usage, and seasonal and environmental variables (temperature and humidity)

What is nanoe Technology? nanoe™ X Effects of nanoe™ Effects of Compilation of supporting

Odours

evidence

Test

reports

Bacteria

Hazardous (PM2.5)

(PM2.5)

5 features supporting the effects of

Feature 1: Abundant moisture volume | Feature 2: Many OH radicals | Feature 3: Long-lasting | Feature 4: Nano-sized

nanoe^{$^{\text{\tiny M}}$} X and nanoe^{$^{\text{\tiny M}}$}.

Feature 5: Maintenance-free

1) The amount of water is approximately

1,000 times*1 that of air ions.

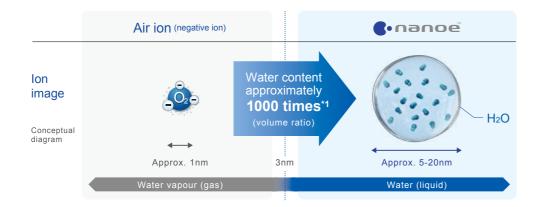
(volume ratio

negative ion

nanoe[™] X and nanoe[™] are tiny ions with their sizes in the nanometers.

The amount of water included is approximately

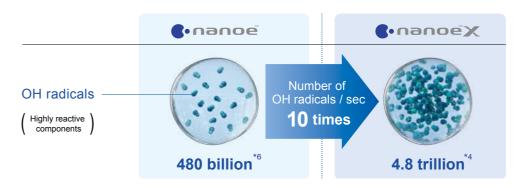
1,000 *1 (volume ratio) times that of air ions (negative ions).



Surrounded by water = long-lasting (Refer to page 28, Feature 3)

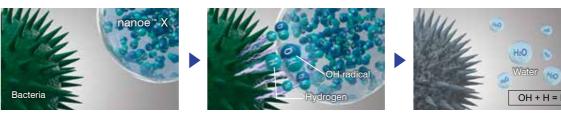
2) The main element in inhibiting bacteria*2 and viruses*3, OH radicals, are generated at a rate of **4.8 trillion per second**.*4

nanoe[™] **X** and nanoe[™] are capsules of water containing an abundance of OH radicals. Nano-sized capsules of water enveloping large amounts of OH radicals are released en masse into the air. OH radicals draw hydrogen atoms from bacteria*² and allergens*⁵ that are in the air. The more OH radicals there are, the more effectively bacteria*² and viruses*³ can be inhibited.



The more OH radicals there are, the more effectively bacteria*2 and viruses*3 can be inhibited.

[How nanoe™ X and nanoe™ works]



nanoe™ X and nanoe™ reach bacteria.

OH radicals remove hydrogens from the bacteria.

The bacteria are denatured with the hydrogen removed and transformed into water, inhibiting the bacteria.*2

4AA33-160701-F01, 1V332-180301-F01, 4AA33-160615-F02, 4AA33-160615-F03, 4AA33-160620-F01) - Cpog-derived allergens and cat-derived allergens">- (Testing organisation) Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] dog derived allergens, cat derived allergens [Test result] - (Dog (dander) Inhibited by at least 98% in 1 hour (11M-RPTAPR047_1) - (Cat (dander) Inhibited by at least 98% in 2 hours (11M-RPTAPR051_1) - (Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method [Inhibition method] nanoe™ released [Test substance] Attached mite allergens [Test result] Inhibited by at least 60% in 24 hours (BAA33-130304-F04) - (Testing organisation] Panasonic Product Analysis Center [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] Mould-derived allergens [Test result] Inhibited by at least 93% in 2 hours (11M-RPTMAR076_1) < Pollen> Cedar [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Cedar pollen [Test result] Inhibited by at least 88% in 8 hours (BAA33-130304-F01) Oypress, Orchard grass, Ragweed [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Cypress pollen, Orchard grass pollen, Ragweed pollen [Test result] Inhibiting effect was confirmed in 24 hours (1V332-171010-F04, 1V332-171010-F02, 1V332-171010-F01

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

econd.*4

nanoe *** ?

What is nanoe[†] Technology?

nanoe™ X

Effects of

nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

lergens

8.

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

ar or right

*1 Comparison between common air ions (negative ions) (Representative particle size:1.3nm) and nanoe (Representative particle size:13nm). (Panasonic internal research)

*2 <Airborne bacteria> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of bacteria is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne bacteria [Test result] Inhibited by at least 99.7% in 4 hours (24_0301_1) <Adhered bacteria> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method]] The number of bacteria is measured after direct exposure in an approximately 1m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 24 hours (20_0154_2) Each test was conducted using a single two of bacteria

*3 <Airborne virus > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of virus is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe " released [Test substance] Airborne virus [Test result] Inhibited by at least 99.7% in 6 hours (24_0300_1) <Adhered virus > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method]] The number of virus is measured after direct exposure in an approximately 1m³ sized airtight test room [Inhibition method] nanoe " released [Test substance] Adhered virus [Test result] Inhibited by at least 99.9% in 2 hours (21_0084_1) Each test was conducted using a single type of virus

*4 Measured using ESR method with nanoe™ X humidifier/air purifier released in September 2016.

*5 <nanoe™ X> [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Allergens (Dermatophagoides pteronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander)) [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-160601-FD1, 4AA33-160601-FD1, 4

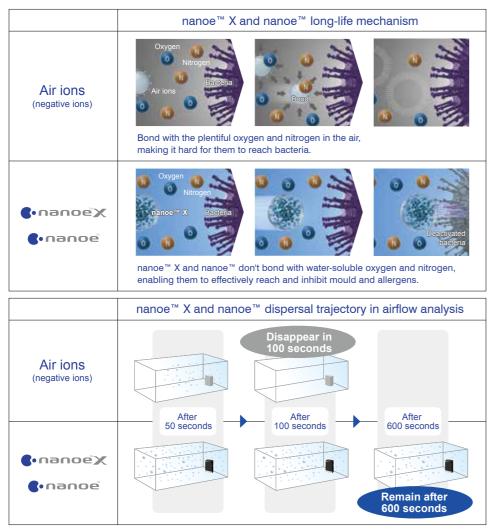
It is a superior ion technology uni que to Panasonic.

Feature 1: Abundant moisture volume | Feature 2: Many OH radicals | Feature 3: Long-lasting | Feature 4: Nano-sized

Feature 5: Maintenance-free

3) Lasts approximately **6 times longer**, reaching a wider area.

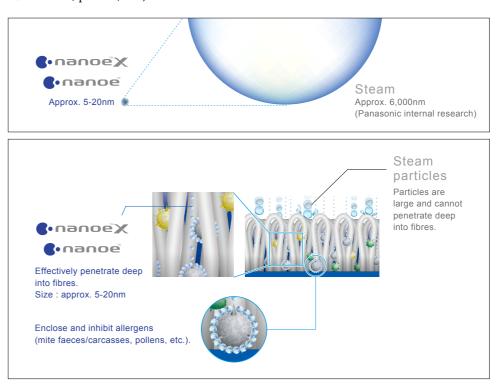
The lifespan of general air ions (negative ions) ranges from in the tens of seconds to 100 seconds. **nanoe**^{$^{\text{TM}}$} **X** and **nanoe**^{$^{\text{TM}}$} have a lifespan of approximately 600 seconds (source: Panasonic internal research). Enveloped in water, **nanoe**^{$^{\text{TM}}$} **X** and **nanoe** $^{\text{TM}}$ have a longer lifespan, which means they can effectively reach a wider area.



Last a long time because they are enveloped in water (Refer to page 26, Feature 1)

4) **Tiny, nano-size** enables deep penetration into fibres.

nanoe[™] X and nanoe[™] are nanometer-sized ions, so they can penetrate deeply into fibers to inhibit the activity of allergens^{*1} (mite faeces/carcasses, pollens, etc.).



5) No maintenance required.

While some ion generating devices require periodic replacement, nanoe $^{\text{\tiny TM}}$ X and nanoe $^{\text{\tiny TM}}$ devices are maintenance-free. No replacement labour or expense is required. *Except in case of malfunction.

substance] dog derived allergens, cat derived allergens [Test result] < Dog (dander)> Inhibited by at least 99% in 1 hour (11M-RPTAPR047_1) < Cat (dander)> Inhibited by at least 98% in 2 hours (11M-RPTAPR051_1) < Mite faeces/carcasses > [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nance™ released [Test substance] Attached mite allergens [Test result] Inhibited by at least 60% in 24 hours (BAA33-130304-F04) < Mould-derived allergens> [Testing organisation] Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nance™ released [Test substance] Mould-derived allergens [Test result] Inhibited by at least 93% in 2 hours (11M-RPTMAR076_1) < Pollen> Cedar [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nance™ released [Test substance] Cedar pollen [Test result] Inhibited by at least 88% in 8 hours (BAA33-130304-F01) Cypress, Orchard grass, Ragweed [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nance™ released [Test substance] Cypress pollen, Orchard grass pollen, Ragweed pollen [Test result] Inhibiting effect was confirmed in 24 hours (1V332-171010-F04, 1V332-171010-F02, 1V332-171010-F01) Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nance™ X and nance™ inhibit activity or growth of viruses, but do not

What is nanoe™ Technology ?

What are nanoe™ X and

Effects of nanoe™ X

Effects of

nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

/lould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

^{*1 &}lt;nanoe™ X> [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Allergens (Dermatophagoides perronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander)) [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-160615-F01, 4AA33-170301-F15, 4AA33-151001-F01, 4AA33-151028-F01, 4AA-33-160615-F02, 4AA33-160615-F03, 4AA33-160615-F03,

The effect of nanoe™ X has been recognised by the Japan Atopic Dermatitis Patients Association.

The first air conditioner to be endorsed by the Japan Atopic Dermatitis Patients Association.

The Japan Atopic Dermatitis Patients Association established a product recommendation system in 2004. Recognising the allergen-inhibition effect of nanoeTM X, air conditioners with nanoeTM X became the first air conditioners to receive this recommendation.

The Japan Atopic Dermatitis Patients Association is a specified non-profit organisation that is a collection of patients, medical personnel, affiliated companies and supporters with the aim of even a small reduction in the difficulties experienced by persons with sensitive skin, including those with various allergies. The organisation carries out activities aimed at achieving mutual understanding, providing accurate information and supporting comfortable living.



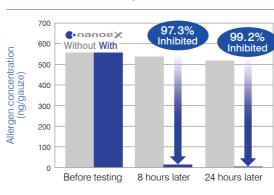
[Proven allergens with nanoe™ X]

(Refer to page 76)

Mites	Dermatophagoides farinae / Dermatophagoides pteronyssinus					
Mould	Alternaria / Aspergillus / Candida / Malassezia					
Animals	Dog (dander) / Cat (dander)					
Insects	Cockroach / Moth					
Tree and shrub pollen	Cedar / Cypress / Alnus japonica / Japanese white birch / Olive / Juniper / Casuarina					
Grass pollen	Orchard grass / Timothy grass / Ragweed / Miscanthus / Artemisia / Humulus japonicus					

Allergen inhibition after 24 hours of exposure to nanoe™ X

Attached allergen (pollen)*1 inhibition performance





Major allergens (attached)*1

€ •nanoeX	Without	With	€ ·nanoeX	Without	With
Dermato- phagoides farinae			Aspergillus		
Malassezia			Dog		
Cat			Cockroach		
Moth		0	Cedar	*	
Cypress			Ragweed		

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses but do not prevent infection.

What is nanoe™
Technology?

What are

Effects of nanoe™ X

nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

^{*1 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Allergens (Dermatophagoides pteronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander)) [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-160615-F01, 4AA33-170301-F15, 4AA33-151001-F01, 4AA33-151028-F01, 4AA-33-160601-F01, 4AA33-160601-F02, 4AA33-160601-F01, 4AA33-16060

Effects of nanoeTM X

nanoe™ X

Hazardous substances (PM2.5)

Eliminates frequently encountered

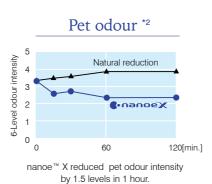
<Not a result of experiments in actual use environments

[Effects]

nanoe[™] X particles, which are smaller than steam particles, penetrate into the deepest parts of fibres, allowing for highly effective deodorisation.*1~8 OH radicals reach the sources of the odours themselves and suppress them until they are barely noticeable.

Latent problems lurking in everyday life Various types of odours can be present in a room and cause discomfort.

Cigarette smoke odour *1 Natural reduction Minimally **€**•nanoe'X Odourless nanoe™ X can reduce cigarette smoke odour intensity by 2.4 levels in 12 minutes.

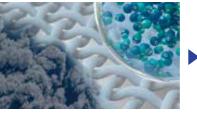




nanoe™ X reduced scalp odour intensity massively in 6 hours.

[How nanoe™ X works]

Quality lifestyle through nanoe[™] X -



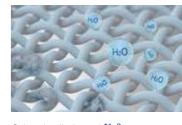
embedded in fibres.

odours.

Garbage odour



Durian odour



nanoe™ X reliably reaches odours

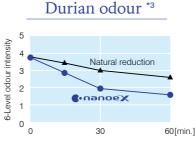
Sweat odour

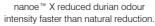
Damp odour

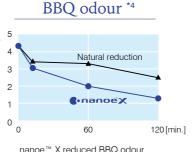
Pet odour

OH radicals break down odour causing substances

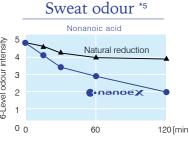
Odour is eliminated.*1~8





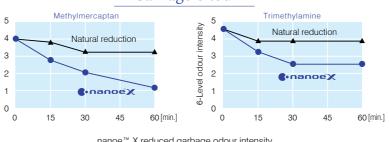


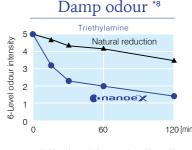




nanoe™ X reduced sweat odou intensity massively in 1 hour.







nanoe™ X reduced garbage odour intensity in 0.5 hours

nanoe™ X reduced damp odour intensity to a hardly noticeable level in 1 hour.

- *1 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe Teleased [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 2.4 levels in 12mins (4AA33-160615-N04)
- *2 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached pet odour [Test result] Odour intensity reduced by 1.5 levels in 1 hour (4AA33-160315-A34)
- *3 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached durian odour [Test result] Odour intensity reduced by 1 level in 0.5 hours (1V332-180402-K01)
- *4 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m3 sized test room [Deodorisation method] nanoe Teleased [Test substance] Surface-attached BBQ odour [Test result] Odour intensity reduced by 1.2 levels in 2 hours (4AA33-151221-N01)
- *5 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test roor sation method] nanoe Teleased [Test substance] Surface-attached sweat odour [Test result] Odour intensity reduced by 1.1 levels in 1 hour (Y16HM016)
- *6 [Testing organisation] Odour and Aroma Design Course, Department of Integrated Informatics, Faculty of Informatics, Daido University [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Simulated body odour of middle-aged and older people attached to pillow cover [Test result] Odour intensity reduced by 0.65 levels in 6 hours
- *7 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nance™ released [Test substance] Surface-attached garbage odour [Test result] < Methylmercaptan > Odour intensity reduced by 1.2 levels in 0.5 hours (1V332-18220-K11) < Trimethylamine > Odour intensity reduced by 1.4 levels in 0.5 hours (1V332-180220-K12)
- *8 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m3 sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached damp odour [Test result] Odour intensity reduced by 1.7 levels in 0.5 hours (Y16RA002)

Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated.

What is nanoe™ Technology?

Scalp odour

What are nanoe™ X and nanoe™?

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Inhibits activity of airborne, adhered bacteria & viruses.

<Not a result of experiments in actual use environments

nanoe™ X envelops and inhibits the activity of airborne and adhered bacteria*1~3 and viruses.*4-5

Latent problems lurking in everyday life

Viruses or bacteria entering your body can cause an allergic reaction or disease.



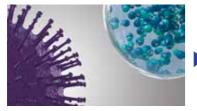
General Information About MRSA in Healthcare Settings

"MRSA is methicillin-resistant Staphylococcus aureus, a type of staph bacteria that is resistant to many antibiotics. In a healthcare setting, such as a hospital or nursing home, MRSA can cause severe problems such as bloodstream infections, pneumonia and surgical site infections. If not treated quickly, MRSA infections can cause sepsis and death."

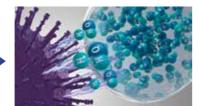
> Source: Centers for Disease Control and Prevention, U.S. Department of Health & Human Services https://www.cdc.gov/mrsa/healthcare/index.html#q1

Quality lifestyle through nanoe[™] X -

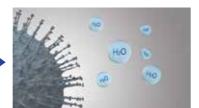
[How nanoe™ X works]





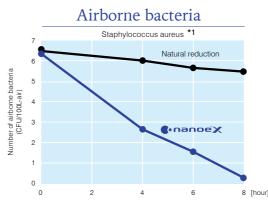


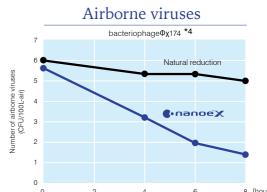
OH radicals transform virus proteins.

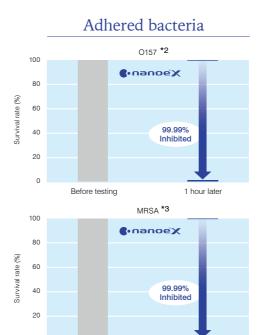


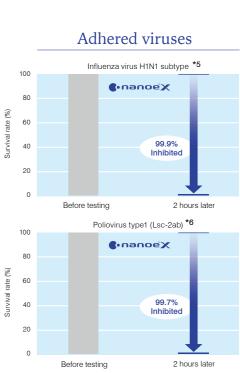
Virus activity is inhibited.*1~6

[Effects]





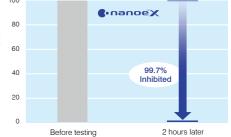




- *5 <Adhered virus (Influenza virus H1N1 subtype) > [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] Measured the number of virus adhered to a cloth in an approximately 1m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered virus [Test result] Inhibited by at least 99.9% in 2 hours (21 0084 1)
- *6 <Adhered virus (Poliovirus type1 (Lsc-2ab))> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] Measured the number of virus adhered to a cloth in an approximately 45L sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered virus [Test result] Inhibited by at least 99.7% in 2 hours

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses

1 hour late



What is nanoe™

Technology?

What are

nanoe™ X and

nanoe™?

nanoe™

Effects of

nanoe-G

Compilation of supporting

evidence

Test

reports

Odours

Bacteria

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

*1 <Airborne bacteria (Staphylococcus aureus)> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of bacteria is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne bacteria [Test result] Inhibited by at least 99.7% in 4 hours (24_0301_1) *2 <Adhered bacteria (O157)> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of bacteria adhered to a cloth in an approximately 45L sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 1 hour (208120880 001)

*3 <Adhered bacteria (MRSA) > [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of bacteria adhered to a cloth in an approximately 45L sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 1 hour (208120880_002)

*4 <Airborne virus (bacteriophage@x174)> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of virus is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne virus [Test result] Inhibited by at least 99.7% in 6 hours (24_0300_1)

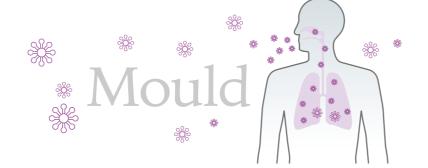
Inhibits activity of airborne mould & adhered mould up

<Not a result of experiments in actual use environments>

Various types of airborne mould*1 found inside rooms are inhibited. Again, even adhered mould*2 is enveloped and inhibited by $\mathbf{nanoe}^{\mathsf{TM}} \mathbf{X}$.

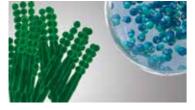
Latent problems lurking in everyday life -

Mould entering your body can cause an allergic reaction or disease.

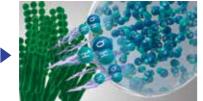


Quality lifestyle through nanoe™ X -

[How nanoe™ X works]



nanoe™ X reliably reaches mould.

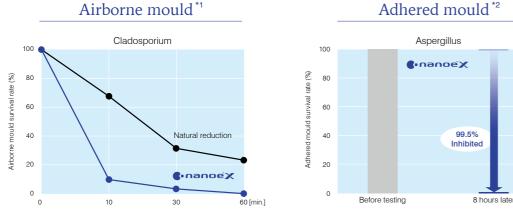


OH radicals denature mould proteins.



Mould activity is inhibited. *1 *2

[Effects]



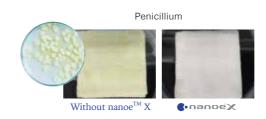
- *1 [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of mould altered in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Airborne mould [Test result] Inhibited by at least 99% in 1 hour (205061541-001)
- *2 [Testing organisation] Japan Food Research Laboratories [Testing method] Measured mould adhered to a cloth [Inhibition method] nanoe™ released [Test substance] Adhered mould [Test result] Inhibited by at least 99.5% in 8 hours (11038081001-02)

adhered mould.

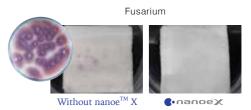
Adhered mould *2



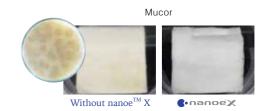














8 varieties of household mould are inhibited



Major types of mould found in house dust : Aspergillus, Cladosporium, Alternaria, Fusarium, Penicillium, Eurotium



Mould found in bathrooms : Stachybotrys*3



Mould found in soil:
Mucor
(Taking into account airborne transfer of mould from soil into the home environment)*4

- *3 Kosuke Takatori, 2002 (Mould Inspection Manual Colour Illustrated Catalogue) p. 382 TECHNO SYSTEMS, Inc.
- *4 Kosuke Takatori, 2002 (Mould Inspection Manual Colour Illustrated Catalogue) p. 44-45 TECHNO SYSTEMS, Inc.

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology ?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

S.

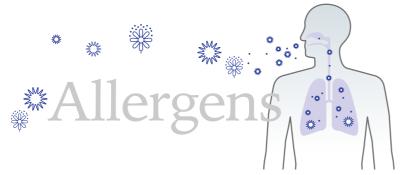
Inhibits pet-derived allergens and

<Not a result of experiments in actual use environments>

In addition to allergens*1 from sources such as dog/cat dander*1, mite faeces/carcasses*1, and airborne mould*1, other major allergens*1 are also inhibited.

Latent problems lurking in everyday life -

Allergens entering your body can cause an allergic reaction or disease.

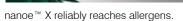


Quality lifestyle through nanoe™ X

[Proven allergens with I	nanoe™ X] (Refer to page 76)						
Mites	Dermatophagoides farinae / Dermatophagoides pteronyssinus						
Mould	Id Alternaria / Aspergillus / Candida / Malassezia						
Animals	Dog (dander) / Cat (dander)						
Insects	Cockroach / Moth						
Tree and shrub pollen	Cedar / Cypress / Alnus japonica / Japanese white birch / Olive / Juniper / Casuarina						
Grass pollen	Orchard grass / Timothy grass / Ragweed / Miscanthus / Artemisia / Humulus japonicus						

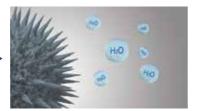
[How nanoe™ X works]







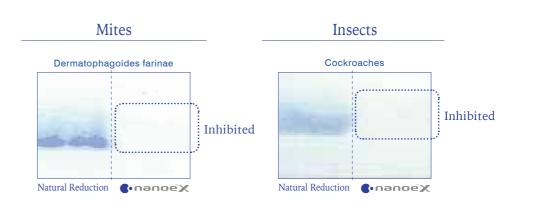
OH radicals denature allergen proteins.

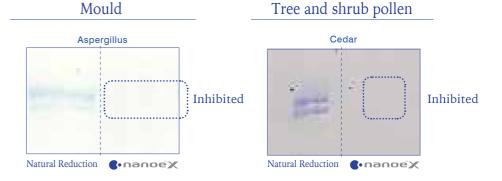


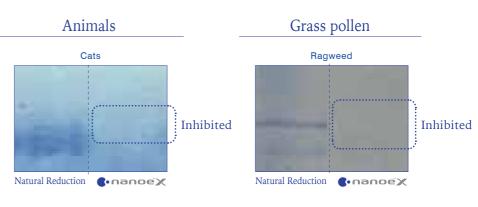
Allergen is inhibited.*1



[Effects] Inhibition*1 effect verified by disappearance of coloured section (band) that reacts to allergens







Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology ?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Test reports

Odours

Bacteria

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

41

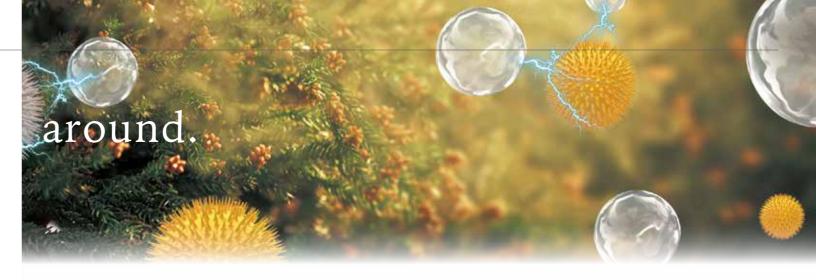
^{*1 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Allergens (Dermatophagoides pteronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander)) [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-160615-F01, 4AA33-170301-F15, 4AA33-151001-F01, 4AA33-151028-F01, 4AA33-160601-F01, 4AA33-160615-F02, 4AA33-160615-F03, 4AA33-160620-F01)

Inhibits pollens globally all year

<Not a result of experiments in actual use environments>

nanoe™ X reliably reaches pollen.

nanoe ™ X is effective in inhibiting*1 a variety of pollens globally all year around. The inhibition effect has been confirmed for the 13 varieties shown below, including those found in Europe and North America.



Country	January	February	March		April	May	June	July		August	September	October	November	December
			Cedar											
				Су	press									
								Orchard grass	s					
											Ragweed			
											Miscanthus			
					Japa	nese white birch	1							
Japan											Artemisia			
_						(Dlive							
					Juniper									
					1	Casuarina	T :							
		Alnus japoni	ica											
-							Timothy gras	S .						
										1	Humulus japonicus	I I		
S. Northeast					A I	Inus japonica	T :				Ragweed			
Boston –								Timothy grass			Hagweed			
		L	Alnus japonio				T :	Timothy grass	T T		T :			
U.S. West		Timothy grass						Timothy grass						
California, Drange county			T i				Ragweed	Tilliotily grass						
Canada					Alnus japonica		ragirood							
Vancouver							Grass family	/	I					
								Grass family	<u>' </u>					
England								Artemisia						
_								Grass family	/					
France				Ra	gweed					agweed				
Consis				Olive										
Spain						Grass fam	ily							
Itoly						Olive								
Italy							Grass	s family						
					A	lnus japonica								
Finland								Gras	ss fa	mily				
										Artemisia	ı			

*1 <Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus pollen> [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe Teleased [Test substance] Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus pollen [Test result] Inhibiting effect was confirmed in 24 hours (4AA33-151015-F01, 4AA33-151028-F01, 4AA33-160601-F01, 4AA33-160601-F02, 4AA33-160701-F01, 1V332-180301-F01)

OH radicals denature pollen proteins.

Pollen is inhibited.*1

California, Orange county

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses,

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

> Test reports

Odours

Bacteria & viruses











substances (PM2.5)

Dust (PM2.5)

< Not a result of experiments in actual use environments:

Breakdown effect of aromatic carboxylic acid(benzoic acid) and paraffin(hexadecane), harmful substances, have been verified.*1

Latent problems lurking in everyday life

PM2.5 entering your body can cause an allergic reaction or disease.



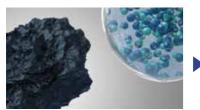
Quality lifestyle through nanoe™ X

[Proven hazardous substances with nanoe™ X] (Refer to page 80)

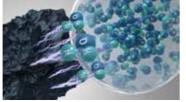
Hazardous substances	Properties of substances	IARC * Evaluation of carcinogenic risks to humans
Aromatic carboxylic acid (Benzoic acid)	Considered to be one cause of acid rain	_
Paraffin (Hexadecane)	Contained in gasoline and diesel exhaust gas, and considered to be one cause of oil odor	_
Benz [a] anthracene (BaA)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Benzo [b] fluoranthene (BbF)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Benzo [a] pyrene (BaP)	Considered to be high carcinogenic risk	1 Carcinogenic to humans
Indeno [1,2,3-cd] pyrene (IcP)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Dibenzo [a,h] anthracene (Dha)	Considered to be high carcinogenic risk	2A Probably carcinogenic to humans

^{*} International Agency for Research on Cancer, IARC; A cancer-dedicated WHO (World Health Organization) agency, that conducts cancer-prevention research.

[How nanoe™ X works]



nanoe™ X reliably reaches hazardous substance.



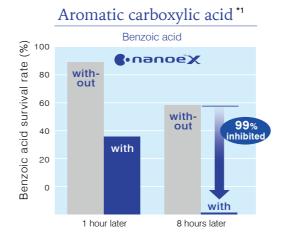
OH radicals denature hazardous substance proteins.

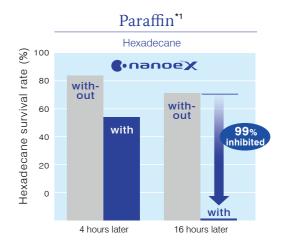


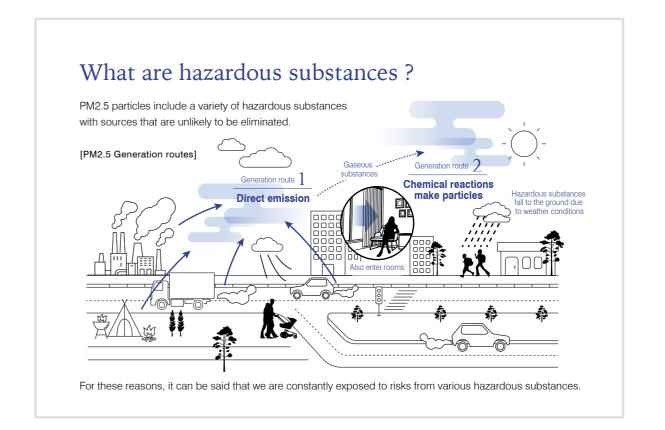
Hazardous substance is inhibited.*1

Breakdown/inhibition of hazardous substances known to be found in PM2.5.

[Effects]







Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

> Test reports

Odours

Bacteria

& viruses

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

^{*1 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Measured the amount of attached organic substances in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test result] <Aromatic carboxylic acid (benzoic acid)> Broken down at least 99% in approximately 8 hours (Y17NF096) <Paraffin (hexadecane) > Broken down at least 99% in approximately 16 hours (Y17NF089)

Moisturised skin, straighter & sleek er hair.

<Not a result of experiments in actual use environments>

nanoe[™] X combines with natural sebum to coat the skin, leading to smooth, well-hydrated skin.*1*2 Furthermore, the abundant moisture found in nanoe™ X hydrates the hair, contributing to straighter, sleeker hair.*3

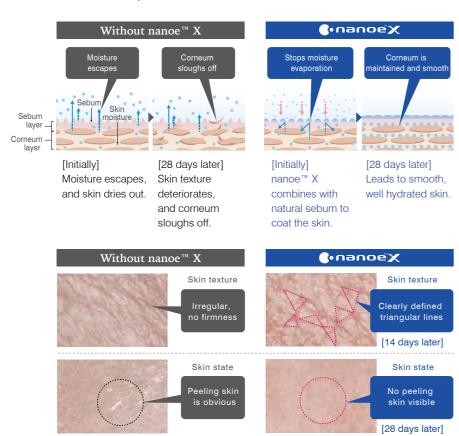
Latent problems lurking in everyday life -

Insufficient moisture in the skin can cause itching or a loss of firmness. In addition, hair can become frizzy and difficult to control.



Quality lifestyle through nanoe™ X

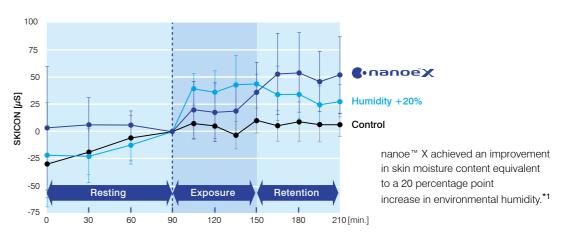
Leads to smooth, well-hydrated skin.*1*2



- *1 [Testing organisation] Panasonic Product Analysis Center [Testing method] Rest period: 90 minutes, nance ** exposure time: 60 minutes, retention: 60 minutes, 8 women aged 30~49 with dry to normal skin. [Test result] Change in skin moisture content equivalent to a 20 percentage point increase from 30% --> 50% in environmental humidity (USG-KT-14K-012-TM
- *2 [Testing organisation] FCG Research Institute, Inc. [Testing method and test result] Of 20 women 40 ± 2 years old, 10 women used a nanoe™ generating device at home for 28 days while the other 10 women used a device with no nanoe™ generating device for 28 days at home. (19104)



Showed an improvement in skin moisture content equivalent to a 20 percentage point increase in humidity.*1*2



Hair is straighter, and smoother to the touch.*3



The hair's moisture balance fails, leading to frizzy hair. With difficulty reflecting light, gloss is reduced and texture is grainy.



Helps the hair achieve a proper moisture balance, making for shiny hair that reflects light and allows fingers to be run through it smoothly.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

nanoe™

Effects of

Compilation of supporting evidence

> Test reports

Odours

Bacteria

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

Individual results may vary based on usage, and seasonal and environmental variables (temperature and humidity)

Bundles (6 bundles) of hair were suspended 2m from a nanoe energing device, with repeated operation of the nanoe energing device: 8 hours on and 16 hours off. (USD-KS-15S-009-TM)

*3 [Testing organisation] Panasonic Product Analysis Center [Testing method and test result] Approximately 46m³ sized test room, room temperature 25 degrees Celsius, humidity 40%.

Effects of nanoeTM

Effects of nanoe™











Eliminates frequently encountered

<Not a result of experiments in actual use environments>

nanoe[™] particles, which are smaller than steam particles, penetrate into the deepest parts of fibres, allowing for highly effective deodorisation*1-3. OH radicals reach the sources of the odours themselves and suppress them until they are barely noticeable.

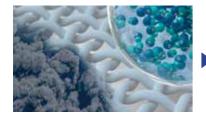
Latent problems lurking in everyday life

Various types of odours can be present in a room and cause discomfort.

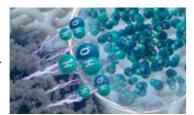


Quality lifestyle through nanoe™

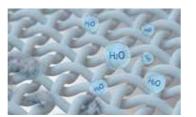
[How nanoe™ works]



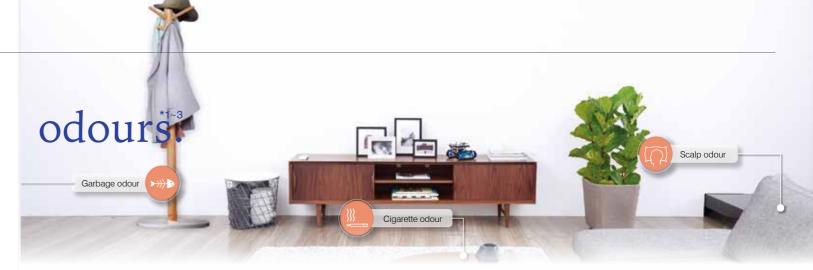
nanoe™ reliably reaches odours embedded in fibres.



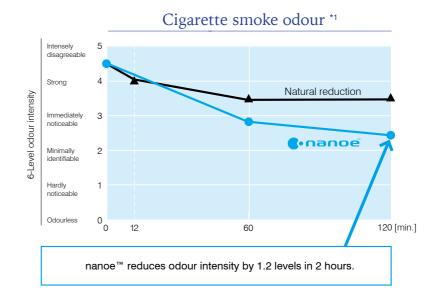
OH radicals break down odour causing substances.

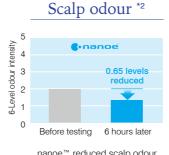


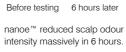
*1 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 1.2 levels in 2 hours (BAA33-130125-D01)

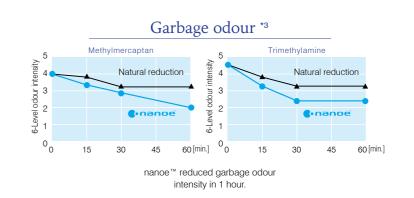


[Effects]









Technology?

nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe-G

Compilation of supporting evidence

> Test reports

Bacteria & viruses

Mould

Hazardous

(PM2.5) (PM2.5)

Skin & hair

Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated.

^{*2 [}Testing organisation] Odour and Aroma Design Course, Department of Integrated Informatics, Faculty of Informatics, Daido University [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nance™ released [Test substance] Simulated body odour of middle-aged and older people attached to pillow cover [Test result] Odour intensity reduced by 0.65 levels in 6 hours

^{*3 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nanoe™ released [Test substance] Surface-attached garbage odour

Test result] < Methylmercaptan > Odour intensity reduced by 1.2 levels in 1 hour (1V332-180316-K21) < Trimethylilamine > Odour intensity reduced by 0.9 levels in 1 hour (1V332-180316-K22)

Inhibits activity of airborne, adhered bacteria & viruses.

<Not a result of experiments in actual use environments>

nanoe[™] envelops and inhibits the activity of airborne and adhered bacteria*1-3 and viruses.*4-6

Latent problems lurking in everyday life

Viruses or bacteria entering your body can cause an allergic reaction or disease.



General Information About MRSA in Healthcare Settings

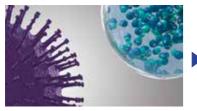
"MRSA is methicillin-resistant Staphylococcus aureus, a type of staph bacteria that is resistant to many antibiotics. In a healthcare setting, such as a hospital or nursing home, MRSA can cause severe problems such as bloodstream infections, pneumonia and surgical site infections. If not treated quickly,

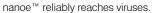
MRSA infections can cause sepsis and death."

Source: Centers for Disease Control and Prevention, U.S. Department of Health & Human Services https://www.cdc.gov/mrsa/healthcare/index.html #q1

Quality lifestyle through nanoeTM –

[How nanoe™ works]





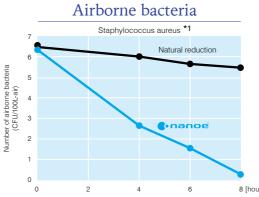


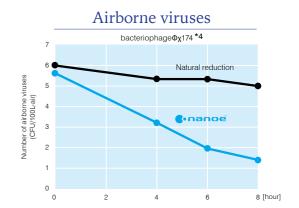
OH radicals transform virus proteins.

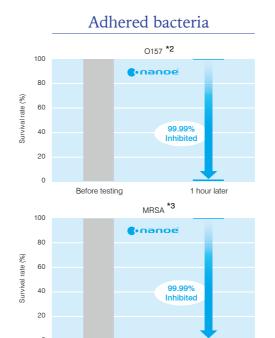


Virus activity is inhibited.*1~6

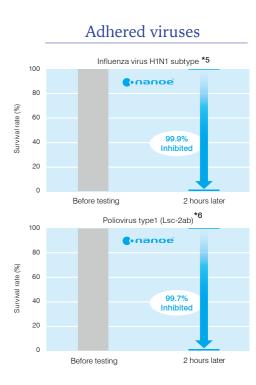
[Effects]







Before testing



- *1 <Airborne bacteria (Staphylococcus aureus)> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of bacteria is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne bacteria [Test result] Inhibited by at least 99.7% in 4 hours (24_0301_1)
 *2 <Adhered bacteria (O157)> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of bacteria adhered to a cloth in an approximately 45L sized
- *2 <Adhered bacteria (O157)> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of bacteria adhered to a cloth in an approximately 45L sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 1 hour (208120880_001)
 *3 <Adhered bacteria (MRSA)> [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of bacteria adhered to a cloth in an approximately 45L sized
- airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered bacteria [Test result] Inhibited by at least 99.99% in 1 hour (208120880_002)

 *4 <Airborne virus (bacteriophage®x174)> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] The number of virus is measured after direct exposure in an approximately 25m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Airborne virus [Test result] Inhibited by at least 99.7% in 6 hours (24_0300_1)
- *5 <Adhered virus (Influenza virus H1N1 subtype)> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] Measured the number of virus adhered to a cloth in an approximately 1m³ sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered virus [Test result] Inhibited by at least 99.9% in 2 hours (21_0084_1)
- *6 <Adhered virus (Poliovirus type1(Lsc-2ab))> [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] Measured the number of virus adhered to a cloth in an approximately 45L sized airtight test room [Inhibition method] nanoe™ released [Test substance] Adhered virus [Test result] Inhibited by at least 99.7% in 2 hours (22 0096)

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses but do not prevent infection.

1 hour later

What is nanoe™ Technology ?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of

Effects of

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

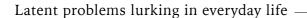
> Dust (PM2.5)

Skin & hair

Inhibits activity of airborne mould & adhered mould und

<Not a result of experiments in actual use environments>

Various types of airborne mould*1 found inside rooms are inhibited. Furthermore, even adhered mould*2 is enveloped and inhibited by nanoe™.

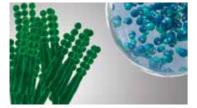


Mould entering your body can cause an allergic reaction or disease.

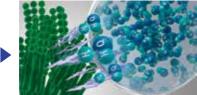


Quality lifestyle through nanoe™

[How nanoe™ works]



nanoe™ reliably reaches mould.

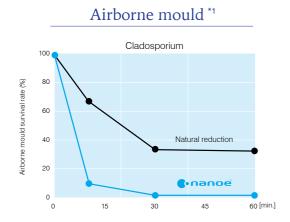


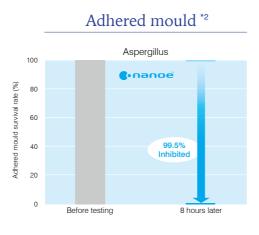
OH radicals denature mould proteins.



Mould activity is inhibited. *1 *2

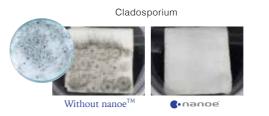
[Effects]





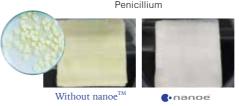
- *1 [Testing organisation] Japan Food Research Laboratories [Testing method] Measured the number of mould altered in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Airborne mould [Test result] Inhibited by at least 99% in 1 hour (205061541-001)
- *2 [Testing organisation] Japan Food Research Laboratories [Testing method] Measured mould adhered to a cloth [Inhibition method] nanoe™ released [Test substance] Adhered mould [Test result] Inhibited by at least 99.5% in 8 hours (11038081001-02)

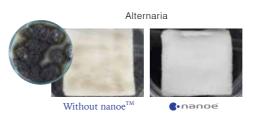
Adhered mould *2

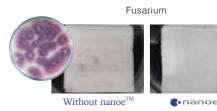


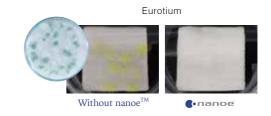


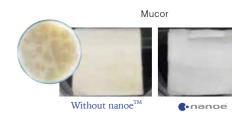














8 varieties of household mould are inhibited



Major types of mould found in house dust: Aspergillus, Cladosporium, Alternaria, Fusarium, Penicillium, Eurotium



Mould found in bathrooms: Stachybotrys*3



Mould found in soil: Mucor (Taking into account airborne transfer of mould from soil into the home environment) *4

- *3 Kosuke Takatori, 2002 (Mould Inspection Manual Colour Illustrated Catalogue) p. 382 TECHNO SYSTEMS, Inc.
- *4 Kosuke Takatori, 2002 (Mould Inspection Manual Colour Illustrated Catalogue) p. 44-45 TECHNO SYSTEMS, Inc.

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nance ** X and nance ** inhibit activity or growth of viruses,

What is nanoe™ Technology?

nanoe™ X and nanoe™ ?

> Effects of nanoe™ X

Effects of nanoe-G

Compilation of supporting evidence

> Test reports

Odours

Bacteria & viruses

Mould

Hazardous substances

(PM2.5)

(PM2.5)

Skin & hair

Inhibits pet-derived allergens and

<Not a result of experiments in actual use environments>

In addition to allergens*1 from sources such as dog/cat dander*1, mite faeces/carcasses*1, and airborne mould*1, other major allergens*1 are also inhibited.

Latent problems lurking in everyday life

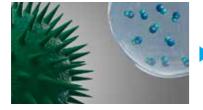
Allergens entering your body can cause an allergic reaction or disease.

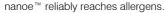


Quality lifestyle through nanoe™

[Proven allergens with nan	oe [™]] (Refer to page 77)
Mites	Dermatophagoides farinae
Mould	Aspergillus
Animals	Dog (dander) / Cat (dander)
Tree and shrub pollen	Cedar / Cypress
Grass pollen	Orchard grass / Ragweed

[How nanoe™ works]







OH radicals denature allergen proteins.



Allergen is inhibited.*1



Country	January February March April			ril	May	Jun	ie	July	August Septe		September		October		November		December		
		(Cedar																
lonen				Cypr	ress														
Japan						Orchard grass													
												Rag	weed						
U.S. Northeast Boston						Ragweed													
U.S. West California, Orange county						Ra	agwee	d	·										
Canada Vancouver								G	Grass famil	у									
England								Gra	ss family										
France								G	Grass famil	у									
Tidrice				Ragw	veed			Ragweed											
Spain					(Grass fai	mily												
Italy						G	arass f	amil	у										
													\vdash						_

Dispersal calendar for major pollens 1 *Pollen dispersal periods and regions may differ depending on the time of year

[Source] JAPAN : Panasonic internal research WORLD : TripAdvisor, Inc., World Pollen Calendar: https://tg.tripadvisor.jp/news/graphic/allergies/



Orchard grass

Ragweed

Dust (PM2.5)

Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Cedar pollen [Test result] Inhibited by at least 88% in 8 hours (BAA33-130304-F01) Cypress, Orchard grass, Ragweed [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the electrophoresis method in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Cypress pollen, Orchard grass pollen, Ragweed pollen [Test result] Inhibiting effect was confirmed in 24 hours (1V332-171010-F04, 1V332-171010-F02, 1V332-171010-F01)

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria

Mould

Pollen

(PM2.5)

Hazardous substances

Skin & hair

^{*1 &}lt;Dog-derived allergens and cat-derived allergens> [Testing organisation] Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] dog derived allergens, cat derived allergens [Test result] <Dog (dander)> Inhibited by at least 99% in 1 hour (11M-RPTAPRO47_1) <Cat (dander)> Inhibited by at least 98% in 2 hours (11M-RPTAPR051_1) <Mite faeces/carcasses> [Testing organisation] Panasonic Product Analysis Center [Testing method] Measured allergen attached to a cloth, using the ELISA method, in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test substance] Attached mite allergens [Test result] Inhibited by at least 60% in 24 hours (BAA33-130304-F04) <Mould-derived allergens [Testing organisation] Institute of Tokyo Environmental Allergens [Testing method] Direct exposure in a 45L airtight container and measured using the ELISA method [Inhibition method] nanoe™ released [Test substance] Mould-derived allergens [Test result] Inhibited by at least 93% in 2 hours (11M-RPTMAR076_1) <Pollen> Cedar [Testing organisation] Panasonic Product Analysis

< Not a result of experiments in actual use environments:

Breakdown effect of aromatic carboxylic acid(benzoic acid) and paraffin(hexadecane), harmful substances, have been verified.*1

Latent problems lurking in everyday life

PM2.5 entering your body can cause an allergic reaction or disease.



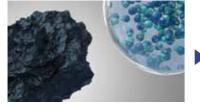
Quality lifestyle through nanoe™

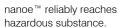
Proven hazardous substances with nanoe™	(Refer to page 81)

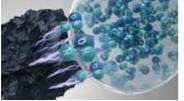
Hazardous substances	Properties of substances	IARC * Evaluation of carcinogenic risks to humans
Aromatic carboxylic acid (Benzoic acid)	Considered to be one cause of acid rain	_
Paraffin (Hexadecane)	Contained in gasoline and diesel exhaust gas, and considered to be one cause of oil odor	_
Benz [a] anthracene (BaA)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Benzo [b] fluoranthene (BbF)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Benzo [a] pyrene (BaP)	Considered to be high carcinogenic risk	1 Carcinogenic to humans
Indeno [1,2,3-cd] pyrene (IcP)	Considered to be high carcinogenic risk	2B Possibly carcinogenic to humans
Dibenzo [a,h] anthracene (Dha)	Considered to be high carcinogenic risk	2A Probably carcinogenic to humans

^{*} International Agency for Research on Cancer, IARC; A cancer-dedicated WHO (World Health Organization) agency, that conducts cancer-prevention research.

[How nanoe[™] works]







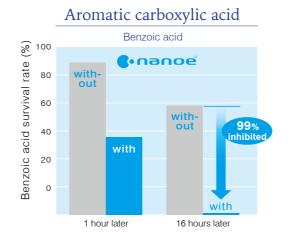
OH radicals denature hazardous substance proteins.

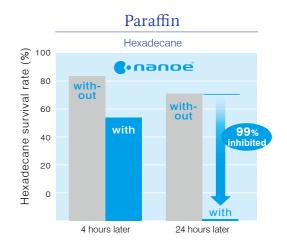


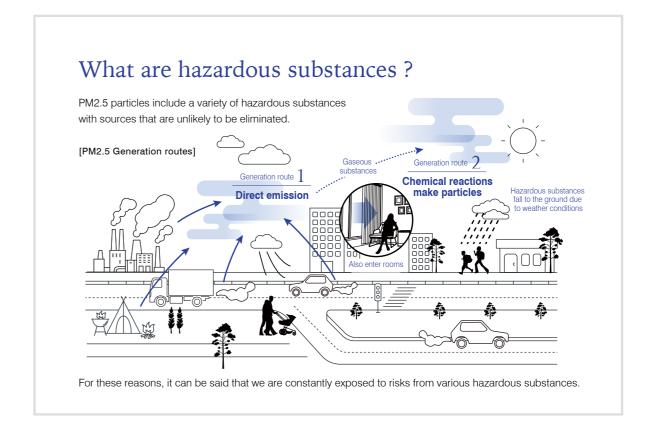
Hazardous substance is inhibited.*1

Breakdown/inhibition of hazardous substances known to be found in PM2.5.

[Effects]







Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology?

nanoe™ X and nanoe™ ?

> Effects of nanoe™ X

Effects of

nanoe-G

Compilation of supporting evidence

> Test reports

Odours

Bacteria & viruses

Mould

Hazardous

substances (PM2.5)

(PM2.5)

Skin & hair

^{*1 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Measured the amount of attached organic substances in an approximately 23m³ sized test room [Inhibition method] nanoe™ released [Test result] <Aromatic carboxylic acid (benzoic acid)> Broken down at least 99.9% in approximately 16 hours (Y13NF135) <Paraffin (hexadecane) > Broken down at least 99% in approximately 24 hours (Y13NF136)

Moisturised skin, straighter & sleek er hair.

<Not a result of experiments in actual use environments>

nanoe[™] combines with natural sebum to coat the skin, leading to smooth, well-hydrated skin.*1*2 Furthermore, the abundant moisture found in nanoe™ hydrates the hair, contributing to straighter, sleeker hair.*3

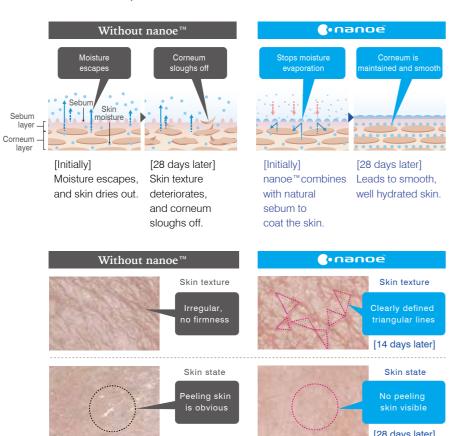
Latent problems lurking in everyday life -

Insufficient moisture in the skin can cause itching or a loss of firmness. In addition, hair can become frizzy and difficult to control.



Quality lifestyle through nanoe™

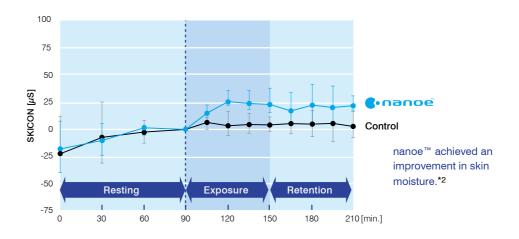
Leads to smooth, well-hydrated skin.*1*2



- *1 [Testing organisation] Panasonic Product Analysis Center [Testing method & test result] Approximately 34m³ sized test room, room temperature 23 degrees Celsius, humidity 30% 8 women aged 30~49 with varying skin conditions ranging from being averagely moist to dry, the stratum corneum water content was measured before and after resting for 90 minutes being exposed to a nanoe™ generating device, to find the average value of the change. (D01-071219F-01)
- *2 [Testing organisation] FCG Research Institute, Inc. [Testing method and test result] Of 20 women 40 ± 2 years old, 10 women used a nanoe™ generating device at home for 28 days while the other 10 women used a device with no nanoe™ generating device for 28 days at home. (19104)



Furthermore, keeps the skin moisturised.*1*2



Hair is straighter, and smoother to the touch.*3



*3 [Testing organisation] Panasonic Product Analysis Center [Testing method and test result] Approximately 46m³ sized test room, room temperature 25 degrees Celsius, humidity 40%.

Bundles (6 bundles) of hair were suspended 2m from a nanoe™ generating device, with repeated operation of the nanoe™ generating device: 8 hours on and 16 hours off. (D01-091005-01TM)

The hair's moisture balance fails, leading to frizzy hair. With difficulty reflecting light, gloss is reduced and texture is grainy.

Helps the hair achieve a proper moisture balance, making for shiny hair that reflects light and allows fingers to be run through it smoothly.

Technology?

nanoe™ X and nanoe™ ?

> Effects of nanoe™ X

Effects of nanoe-G

Compilation of supporting evidence

> Test reports

Odours

Bacteria & viruses

Mould

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

Individual results may vary based on usage, and seasonal and environmental variables (temperature and humidity).

5

Effects of nanoe-G

Vhat is nanoe™ Technology ?

What are nanoe™ X and nanoe™?

Effects of nance™ X

Effects of

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria

ould

Allergens

Allergens

Pollen

Hazardous ubstances

Dust

(PM2.5)

Removes airborne particles up to

<Not a result of experiments in actual use environments>

nanoe-G charges dust particles as small as PM2.5 with negative electricity and catches them. The air conditioner uses a suction airflow to draw in dust and collect it in an air filter. For as long as the air conditioner is active, the air in the room is being constantly cleaned.

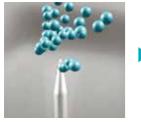
Latent problems lurking in everyday life

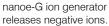
PM2.5 entering your body can cause an allergic reaction or disease.

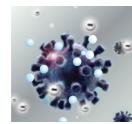


Quality lifestyle through nanoe-G

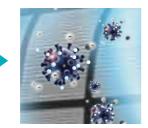
[How nanoe-G works]



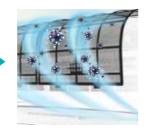




Negative ions attach to dust particles.

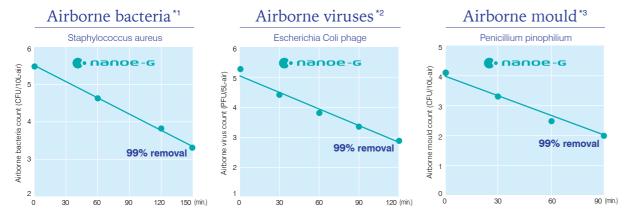


These particles are carried back to the air filter



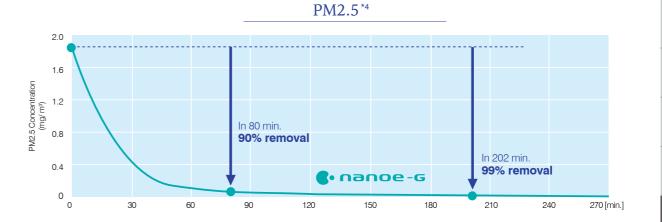
Deactivates 99%*5 *6 of bacteria and viruses trapped in the filter

[Effects]



- *1 [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] nanoe-G mounted air conditioner was operated and tested in a 25m³ sized test room [Test result] Removed by 99% in 150 minutes (compared to the initial concentration) (23_0182))
- *2 [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] nanoe-G mounted air conditioner was operated and tested in a 25m³ sized test room [Test result] Removed by 99% in 120 minutes (compared to the initial concentration) (22 0008)
- *3 [Testing organisation] Kitasato Research Center for Environmental Science [Testing method] nanoe-G mounted air conditioner was operated and tested in a 25m3 sized test room [Test result] Removed by 99% in 90 minutes (compared to non-operation) (23 0140)
- *4 [Testing organisation] FCG Research Institute, Inc. [Testing method] nanoe-G mounted air conditioner was operated and tested in a 23m³ sized test room [Test result] Removed by 99% in 202 minutes (compared to the initial concentration) (25034)

99%.*1~4



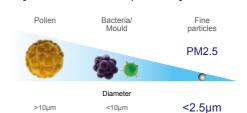
What is PM2.5?

"Particulate matter," also known as "PM", is made up of a number of components including extremely small particles and liquid droplets. At less than 2.5 micrometers (PM2.5), these particles are said to pose health problems as they can easily enter

[Typical types of PM2.5]

PM2.5 can be found suspended in the air, being included in dust, dirt, smoke and liquid droplets. These fine particles come from manmade sources such as the combustion of fossil fuels, open burning and industrial processes, as well as natural ones, which include sea sprays and dust carried by strong winds.

[Particle size comparison]



- *5 [Testing organisation] Japan Food Research Laboratories [Testing method] nanoe-G mounted air conditioner was operated and tested in a test box [Test result] Removed by 99% in 2 hours (compared to non-operation) (12037932001-02)
- *6 [Testing organisation] Japan Food Research Laboratories [Testing method] nanoe-G mounted air conditioner was operated and tested in a test box [Test result] Removed by 99% in 2 hours (compared to non-operation) (12014705001-02)

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe-G inhibit activity or growth of viruses,

Technology?

What are nanoe™ X and nanoe™ ?

> Effects of nanoe™ X

Effects of nanoe™

of supporting

Test reports

Odours

Bacteria & viruses

Mould

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

Compilation of supporting evidence

of supporting

Dust (PM2.5)

1: Odours

[Representative evidence]

*1 : Units based on Panasonic standards

-		-					
	Odours	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	Cigarette smoke odour	Odour intensity reduced by 2.4 levels	Approx. 23m³	0.2	Panasonic Product Analysis Center	4AA33-160615-N04	90
	BBQ odour	Odour intensity reduced by 1.2 levels	Approx. 23m³	2	Panasonic Product Analysis Center	4AA33-151221-N01	91
	Pet odour	Odour intensity reduced by 1.5 levels	Approx. 23m³	1	Panasonic Product Analysis Center	4AA33-160315-A34	92
	Sweat odour (Hexanoic acid)	Odour intensity reduced by 2.6 levels	Approx. 23m³	1	Panasonic Product Analysis Center	4AA33-160315-A35	93
	Sweat odour (Nonanoic acid)	Odour intensity reduced by 1.1 levels	Approx. 23m³	1	Panasonic Product Analysis Center	Y16HM016	94
	Damp odour (Triethylamine)	Odour intensity reduced by 1.7 levels	Approx. 23m³	0.5	Panasonic Product Analysis Center	Y16RA002	95
	Garbage odour (Methylmercaptan)	Odour intensity reduced by 1.2 levels	Approx. 23m³	0.5	Panasonic Product Analysis Center	1V332-18220-K11	96
	Garbage odour (Trimethylamine)	Odour intensity reduced by 1.4 levels	Approx. 23m³	0.5	Panasonic Product Analysis Center	1V332-180220-K12	97
	Durian odour	Odour intensity reduced by 1.0 level	Approx. 23m³	0.5	Panasonic Product Analysis Center	1V332-180402-K01	98
	Scalp odour (Pillow cover)	Odour intensity reduced by 0.65 levels	Approx. 23m ³	6	[Superv Odour and Aroma Department of Integ Faculty of In Daido Un	Design Course, rated Informatics, formatics,	100

[Further evidence]

*1 : Units based on Panasonic standards

	Odours	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	Cigarette smoke odour	Odour intensity reduced by 1.8 levels	Approx. 23m³	0.2	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	99
	BBQ odour	Odour intensity reduced by 1.2 levels	Approx. 23m³	2			
	Pet odour	Odour intensity reduced by 1.5 levels	Approx. 23m³	1			
	Sweat odour	Odour intensity reduced by 1.1 levels	Approx. 23m³	1			
	Damp odour (Triethylamine)	Odour intensity reduced by 2.2 levels	Approx. 23m³	0.5			
	Cigarette smoke odour	Deodorising performance	250L	0.5	Panasonic Product Analysis Center	E02-090313MH-01	101
	Garbage odour (Methylmercaptan)	Deodorising performance	250L	0.25	Panasonic Product Analysis Center	E02-080219MH-01	102
	Pet odour	Odour intensity reduced by 33.9%	Approx. 11.5m² Pet shop cage room (Average 13 pets in a room)	Approx. 1 week	[Supervision] Odour and Aroma Design Course, Department of Integrated Informatics, Faculty of Informatics, Daido University		103

C•nanoe e

1: Odours

[Representative evidence]

*1: Units based on Panasonic standards

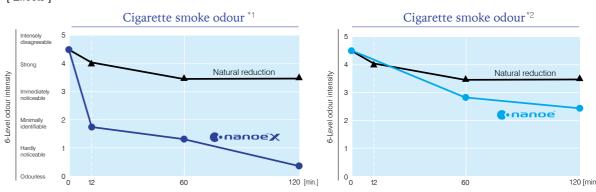
	Odours	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	Cigarette smoke odour	Odour intensity reduced by 1.2 levels	Approx. 23m³	2	Panasonic Product Analysis Center	BAA33-130125-D01	104
	Garbage odour (Methylmercaptan)	Odour intensity reduced by 1.2 levels	Approx. 23m³	1	Panasonic Product Analysis Center	1V332-180316-K21	105
	Garbage odour (Trimethylamine)	Odour intensity reduced by 0.9 levels	Approx. 23m³	1	Panasonic Product Analysis Center	1V332-180316-K22	106
	Scalp odour (Pillow cover)	Odour intensity reduced by 0.65 levels	Approx. 23m³	6	[Supervision] Odour and Aroma Design Course, Department of Integrated Informatics, Faculty of Informatics, Daido University		100

[Further evidence]

*1: Units based on Panasonic standards

	Odours	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	Cigarette smoke odour	Odour intensity reduced by 1.5 levels	Approx. 23m³	2	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	107
	Cigarette smoke odour	Deodorising performance	250L	0.5	Panasonic Product Analysis Center	E02-090313MH-01	101
	Garbage odour (Methylmercaptan)	Deodorising performance	250L	0.25	Panasonic Product Analysis Center	E02-080219MH-01	102
	Pet odour	Odour intensity reduced by 33.9%	Approx. 11.5m² Pet shop cage room (Average 13 pets in a room)	Approx. 1 week	[Supervision] Odour and Aroma Design Course, Department of Integrated Informatics, Faculty of Informatics, Daido University		103

[Effects]



*1 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room

Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

Dust (PM2.5)

[[]Deodorisation method] nanoe released [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 2.4 levels in 12mins (4AA33-160615-N04) *2 [Testing organisation] Panasonic Product Analysis Center [Testing method] Verified using the six-level odour intensity scale method in an approximately 23m³ sized test room [Deodorisation method] nance™ released [Test substance] Surface-attached cigarette smoke odour [Test result] Odour intensity reduced by 1.2 levels in 2 hours (BAA33-130125-D01)

€•nanoe[®]X

2: Bacteria & viruses

[Representative evidence]

*1 : Units based on Panasonic standards

	Bacteria & viruses	Result ^{*1}	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
orne	Virus Bacteriophage ФX174	99.7% inhibited	Approx. 25m³	6	Kitasato Research Center for Environmental Science	24_0300_1	114
Airborne	Bacteria Staphylococcus aureus	99.9% inhibited	Approx. 25m³	4	Kitasato Research Center for Environmental Science	2016_0279	108
ered	Virus Bacteriophage ΦX174	99.8% inhibited	Approx. 25m³	8	Japan Food Research Laboratories	13001265005-01	115
Adhered	Bacteria Staphylococcus aureus	99.1% inhibited	Approx. 23m³	8	Japan Food Research Laboratories	13044083003-01	116
	Influenza virus (H1N1 subtype)	99.9% inhibited	1m³	2	Kitasato Research Center for Environmental Science	21_0084_1	117
Adhered virus	Feline calicivirus (Related form of norovirus)	99.9% inhibited	25L	2	Japan Food Research Laboratories	207031493-001	118
Adhere	Coxackievirus (B6)	99.1% inhibited	45L	2	Kitasato Research Center for Environmental Science	22_0085	119
	Poliovirus type 1 (Lsc-2ab)	99.7% inhibited	45L	2	Kitasato Research Center for Environmental Science	22_0096	120
	Bacterium enterohemorrhagic escherichia coli (O157)	99.99% inhibited	45L	1	Japan Food Research Laboratories	208120880-001	121
	Methicillin-resistant staphylococcus aureus (MRSA)	99.99% inhibited	45L	1	Japan Food Research Laboratories	208120880-002	122
cteria	Staphylococcus aureus	99.99% inhibited	1m³	24	Kitasato Research Center for Environmental Science	20_0154_2	123
Adhered bacteria	Bacillus	99.6% inhibited	45L	0.5	Japan Food Research Laboratories	11000924001-01	124
Adh	Micrococcus	99.9% inhibited	45L	2	Japan Food Research Laboratories	11000924001-02	125
	Serratia	99.9% inhibited	45L	2	Japan Food Research Laboratories	11000924001-03	126
	Kocuria	99.9% inhibited	45L	1	Japan Food Research Laboratories	11000922001-01	127

[Further evidence]

*1 : Units based on Panasonic standards

	Bacteria & viruses		Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
	Virus Bacteriophage ФX174	99.9% inhibited	Approx. 23m³	8	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	109
Adhered	Bacteria staphylococcus aureus	99.9% inhibited	Approx. 23m³	8	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	110
	Bjerkandera adustra (Kosa)	99% inhibited	Approx. 23m³	8	Kanazawa University	-	128
	Influenza virus (H1N1 subtype)	99.9% inhibited	49L	4	Japan Food Research Laboratories	16099930002-0101	111
d virus	Influenza viruses	99% inhibited	Approx. 25m³	2	PASTEUR INSTITUTE IN HO CHI MINH CITY	VILAS Med 014	112
Adhered virus	Bird flu virus (H5N1 and H9N2 subtypes)	99.9% inhibited	45L	4	Obihiro University of Agriculture and Veterinary Medicine Research Center		129
	Swine-origin influenza virus (A/Narita/2009(H1N1)pdm)	99% inhibited	45L	6	for Animal Hygiene and Food Safety	-	130

*1 : Units based on Panasonic standards

	Bacteria & viruses		Capacity	Time (Hr.)	Testing organisation		Refer to page
	Bacteriophage ФX174	99.9% inhibited	10m³	24	Kitasato Research Center for Environmental Science	21_0143_4	131
	Encephalomyocarditis virus	99.9% inhibited	45L	6			
	Porcineparvo virus	99.7% inhibited	45L	6	Charles River		100
	Xenotropic murine leukemia virus	99.999% inhibited	45L	6	Biopharmaceutical Services GmbH	-	132
Adhered virus	Pseudororabies virus	99.9% inhibited	45L	6			
Adhere	Feline corona virus	99.3% inhibited	45L	2	Yamaguchi University Faculty		133
	Canine adeno virus	99.4% inhibited	45L	4	of Agriculture	-	134
	Canine distemper virus	99.7% inhibited	45L	4			135
	Canine parvovirus	99.8% inhibited	45L	6	Rakuno Gakuen University Veterinary Medicine	-	136
	Canine herpesvirus	99.5% inhibited	45L	4			137
-	Bacterium enterohemorrhagic escherichia coli (O157)	99.9% inhibited	45L	2	Eurofins	2010/456-3	138
	Methicillin-resistant staphylococcus aureus (MRSA)	99.99% inhibited	45L	1	Eurofins	2010/456-1	139
	Escherichia coli	99.9% inhibited	45L	1	Panasonic Product Analysis Center	E02-080303IN-01	140
əria	Staphylococcus aureus	99.2% inhibited	10m³	24	Panasonic Product Analysis Center	E02-090701IN-01	141
Adhered bacteria		99% inhibited	10m³	24	Japan Food Research Laboratories	209071031-001	142
Adher	Multiple-drug-resistant pseudomonas aeruginosa (MDRP)	99% inhibited	45L	2	Toho University Faculty of Medicine Department of Infection Control and Prevention	-	143
	MRSP (Methicillin-resistant staphylococcus pseudintermedius)	99.5% inhibited	45L	2	Nippon Medical School		
	Bordetella bronchiseptica	99.9% inhibited	45L	2	Nippon Veterinary and Life Science University	-	144
	Pasteurella multocida	99.9% inhibited	45L	1			
e virus	Bacteriophage	99% inhibited	1m³	1.5	Kitasato Research Center for Environmental Science	20_0154_1	145
Airborne virus	ФХ174	99.2% inhibited	10m³	4	Kitasato Research Center for Environmental Science	21_0147	146
		99.9% inhibited	1m³	0.34	Kitasato Research Center for Environmental Science	20_0154_1	147
Airborne bacteria	Staphylococcus aureus	99% inhibited	10m³	4	Kitasato Research Center for Environmental Science	21_0142	148
Airbol		99.9% inhibited	10m ³	3	Kitasato Research Center for Environmental Science	21_0044	149

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of

Effects of nanoe-G

nanoe™

Compilation
f supporting

Test reports

Odours

Bacteria & viruses



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Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

C•nanoe[™]

2: Bacteria & viruses

[Representative evidence]

*1 : Units based on Panasonic standards

	Bacteria & viruses	Result ^{*1}	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Airborne	Virus Bacteriophage ФX174	99.7% inhibited	Approx. 25m³	6	Kitasato Research Center for Environmental Science	24_0300_1	114
Airb	Bacteria Staphylococcus aureus	99.7% inhibited	Approx. 25m³	4	Kitasato Research Center for Environmental Science	24_0301_1	150
Adhered	Virus Bacteriophage ΦX174	99.8% inhibited	Approx. 25m³	8	Japan Food Research Laboratories	13001265005-01	115
Adh	Bacteria Staphylococcus aureus	99.1% inhibited	Approx. 23m³	8	Japan Food Research Laboratories	13044083003-01	116
	Influenza virus (H1N1 subtype)	99.9% inhibited	1m³	2	Kitasato Research Center for Environmental Science	21_0084_1	117
Adhered virus	Feline calicivirus (Related form of norovirus)	99.9% inhibited	25L	2	Japan Food Research Laboratories	207031493-001	118
Adhere	Coxackievirus (B6)	99.1% inhibited	45L	2	Kitasato Research Center for Environmental Science	22_0085	119
	Poliovirus type 1 (Lsc-2ab)	99.7% inhibited	45L	2	Kitasato Research Center for Environmental Science	22_0096	120
	Bacterium enterohemorrhagic escherichia coli (O157)	99.99% inhibited	45L	1	Japan Food Research Laboratories	208120880-001	121
	Methicillin-resistant staphylococcus aureus (MRSA)	99.99% inhibited	45L	1	Japan Food Research Laboratories	208120880-002	122
ıcteria	Staphylococcus aureus	99.99% inhibited	1m³	24	Kitasato Research Center for Environmental Science	20_0154_2	123
Adhered bacteria	Bacillus	99.6% inhibited	45L	0.5	Japan Food Research Laboratories	11000924001-01	124
Ad	Micrococcus	99.9% inhibited	45L	2	Japan Food Research Laboratories	11000924001-02	125
	Serratia	99.9% inhibited	45L	2	Japan Food Research Laboratories	11000924001-03	126
	Kocuria	99.9% inhibited	45L	1	Japan Food Research Laboratories	11000922001-01	127

[Further evidence]

*1 : Units based on Panasonic standards

	Bacteria & viruses	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
ped	Bjerkandera adustra (Kosa)	99% inhibited	Approx. 23m³	8	Kanazawa University	-	128
Adhered	Bacteria staphylococcus aureus	99% inhibited	Approx. 23m³	8	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	151
	Bird flu virus (H5N1 and H9N2 subtypes)	99.9% inhibited	45L	4	Obihiro University of Agriculture and Veterinary Medicine Research Center for Animal Hygiene and Food Safety	-	129
Adhered virus	Swine-origin influenza virus (A/Narita/2009(H1N1)pdm)	99% inhibited	45L	6			130
Adhere	Bacteriophage ФХ174	99.9% inhibited	10m ³	24	Kitasato Research Center for Environmental Science	21_0143_4	131
	Influenza virus (H1N1 subtype)	99.9% inhibited	45L	4	Japan Food Research Laboratories	208040534-001	152

*1 : Units based on Panasonic standards

	Bacteria & viruses	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
	Encephalomyocarditis virus	99.9% inhibited	45L	6			
	Porcineparvo virus	99.7% inhibited	45L	6	Charles River		100
	Xenotropic murine leukemia virus	99.999% inhibited	45L	6	Biopharmaceutical Services GmbH	-	132
ıns	Pseudororabies virus	99.9% inhibited	45L	6			
Adhered virus	Feline corona virus	99.3% inhibited	45L	2	Yamaguchi University Faculty		133
Ad	Canine adeno virus	99.4% inhibited	45L	4	of Agriculture	-	134
	Canine distemper virus	99.7% inhibited	45L	4			135
	Canine parvovirus	99.8% inhibited	45L	6	Rakuno Gakuen University Veterinary Medicine	-	136
	Canine herpesvirus	99.5% inhibited	45L	4			137
	Bacterium enterohemorrhagic escherichia coli (0157)	99.9% inhibited	45L	2	Eurofins	2010/456-3	138
	Methicillin-resistant staphylococcus aureus (MRSA)	99.99% inhibited	45L	1	Eurofins	2010/456-1	139
	Escherichia coli	99.9% inhibited	45L	1	Panasonic Product Analysis Center	E02-080303IN-01	140
īa i	Staphylococcus aureus	99.2% inhibited	10m³	24	Panasonic Product Analysis Center	E02-090701IN-01	141
Adhered bacteria		99% inhibited	10m ³	24	Japan Food Research Laboratories	209071031-001	142
Adhere	Multiple-drug-resistant pseudomonas aeruginosa (MDRP)	99% inhibited	45L	2	Toho University Faculty of Medicine Department of Infection Control and Prevention	-	143
	MRSP (Methicillin-resistant staphylococcus pseudintermedius)	99.5% inhibited	45L	2	Nippon Medical School		
	Bordetella bronchiseptica	99.9% inhibited	45L	2	Nippon Veterinary and Life Science University	-	144
	Pasteurella multocida	99.9% inhibited	45L	1			
e virus	Bacteriophage	99% inhibited	1m³	1.5	Kitasato Research Center for Environmental Science	20_0154_1	145
Airborne virus	ФХ174	99.2% inhibited	10m³	4	Kitasato Research Center for Environmental Science	21_0147	146
		99.9% inhibited	1m³	0.34	Kitasato Research Center for Environmental Science	20_0154_1	147
Airborne bacteria	Staphylococcus aureus	99% inhibited	10m³	4	Kitasato Research Center for Environmental Science	21_0142	148
Airbo		99.9% inhibited	10m³	3	Kitasato Research Center for Environmental Science	21_0044	149

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses, but do not prevent infection.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of

Effects of nanoe-G

nanoe™

ompilation supporting

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

Dust (PM2.5)

Skin & hair

€•nanoe[™]X

3: Mould

[Representative evidence]

*1 : Units based on Panasonic standards

[ne	presentative evider	ice j			*1:	Units based on Panasonic	standards
	Mould	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Airborne	Cladosporium	99% inhibited	Approx. 23m³	1	Japan Food Research Laboratories	205061541-001	156
	Alternaria	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	18077411001-0201	157
	Aspergillus	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-0801	158
	Cladosporium	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-0901	159
	Eurotium	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	17145307001-1001	160
	Fusarium	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	17145307001-1101	161
	Mucor	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1201	162
_	Penicillium	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1301	163
Adhered	Stachybotrys	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1401	164
	Aspergillus	99.5% inhibited	45L	8	Japan Food Research Laboratories	11038081001-02	165
	Penicillium	99.5% inhibited	45L	4	Japan Food Research Laboratories	11028760001-01	166
	Fusarium	99.9% inhibited	45L	4	Japan Food Research Laboratories	11018692001-02	167
	Eurotium	99.9% inhibited	45L	8	Kitasato Research Center for Environmental Science	22_0455	168
	Mucor	99.9% inhibited	45L	8	Japan Food Research Laboratories	11038080001-01	169
	Stachybotrys	99.9% inhibited	45L	8	Kitasato Research Center for Environmental Science	22_0455	170
	Alternaria	99.9% inhibited	45L	16	Japan Food Research Laboratories	11038082001-01	171

[Further evidence]

*1 : Units based on Panasonic standards

		Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
	Alternaria	Inhibited	Approx. 23m³	4	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	154
	Trichophyton	99.7% inhibited	40L	24	Panasonic Product Analysis Center	E02-061002IN-01	172
7	Cladosporium	99.9% inhibited	45L	4	Panasonic Product Analysis Center	E02-110801IN-01	173
<u> </u>	Candida albicans	99.4% inhibited	45L	2			174
	Cryptococcus neoformans	99.8% inhibited	45L	2	Medical Mycology Research Center (MMRC), Chiba University	-	175
	Malassezia furfur	99.7% inhibited	45L	4	Griba Griversity		176

C•nanoe

3: Mould

[Representative evidence]

*1 : Units based on Panasonic standards

	Mould	Result ¹	Capacity	Time (Hr.)	Testing organisation	Report No.	to page
Airborne	Cladosporium	99% inhibited	Approx. 23m³	1	Japan Food Research Laboratories	205061541-001	156
	Alternaria	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	18077411001-0201	157
	Aspergillus	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-0801	158
	Cladosporium	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	17145307001-0901	159
	Eurotium	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	17145307001-1001	160
	Fusarium	Inhibited	Approx. 23m ³	8	Japan Food Research Laboratories	17145307001-1101	161
	Mucor	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1201	162
_	Penicillium	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1301	163
Adhered	Stachybotrys	Inhibited	Approx. 23m³	8	Japan Food Research Laboratories	17145307001-1401	164
	Aspergillus	99.5% inhibited	45L	8	Japan Food Research Laboratories	11038081001-02	165
	Penicillium	99.5% inhibited	45L	4	Japan Food Research Laboratories	11028760001-01	166
	Fusarium	99.9% inhibited	45L	4	Japan Food Research Laboratories	11018692001-02	167
	Eurotium	99.9% inhibited	45L	8	Kitasato Research Center for Environmental Science	22_0455	168
	Mucor	99.9% inhibited	45L	8	Japan Food Research Laboratories	11038080001-01	169
	Stachybotrys	99.9% inhibited	45L	8	Kitasato Research Center for Environmental Science	22_0455	170
	Alternaria	99.9% inhibited	45L	16	Japan Food Research Laboratories	11038082001-01	171
			·				

[Further evidence]

*1 : Units based on Panasonic standards

			Capacity	Time (Hr.)		Report No.	to page
	Trichophyton	99.7% inhibited	40L	Panasonic Product Analysis Center		E02-061002IN-01	172
	Cladosporium	99.9% inhibited	45L	4	Panasonic Product Analysis Center	E02-110801IN-01	173
Adhered	Candida albicans	99.4% inhibited	45L	2			174
Adhe	Cryptococcus neoformans	99.8% inhibited	45L	2	Medical Mycology Research Center (MMRC),	-	175
	Malassezia furfur	99.7% inhibited	45L	Chiba University 4		176	
	Alternaria	Inhibited	Approx. 23m³	8	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	177

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What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

ompilation supporting

Test reports

Odours

Bacteria & viruses



Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

S. S



Newly verified effects only nanoe™ X delivers

4: Allergens

[Representative evidence]

*1 : Units based on Panasonic standards

		•					
	Allergens		Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Mites	Dermatophagoides pteronyssinus	Inhibited	Approx. 23m ³	24	Panasonic Product Analysis Center	4AA33-160615-F01	178
Ā	Dermatophagoides farinae	Inhibited	Approx. 23m ³	24	Panasonic Product Analysis Center	4AA33-170301-F15	179
	Alternaria (Sooty moulds)	Inhibited	Approx. 23m ³	24	Panasonic Product Analysis Center		
Mould	Aspergillus (Aspergillus genus)	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	44 422 160615 E02	180
Mo	Candida	Inhibited	Approx. 23m ³	24	Panasonic Product Analysis Center	4AA33-100013-F02	100
	Malassezia	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	4AA33-160615-F01	
Insect	Cockroach	Inhibited	Approx. 23m³	24	Panasonic Product	44 400 46064F F00	181
lns	Moth	Inhibited	Approx. 23m ³	24	Analysis Center	4AA33-100013-F03	101
Animal	Dog (dander)	Inhibited	Approx. 23m ³	24	Panasonic Product	44.422.160620.504	182
Ani	Cat (dander)	Inhibited	Approx. 23m³	24	Analysis Center	4AA33-100020-F01	102

[Further evidence]

*1 : Units based on Panasonic standards

	Allergens	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	21 kinds of allergens - Pollen: Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Mugwort, Olive, Juniper, Casuarina, Miscanthus, Timothy grass - Pet: Dog (dander), Cat (dander) - Mould: Aspergillus (Aspergillus genus), Candida, Alternaria (Sooty moulds), Malassezia - Mite: Dermatophagoides pteronyssinus - Insect: Cockroach, Moth	Inhibited	Approx. 23m³	24	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	183
Mites	Dermatophagoides farinae	60% inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	BAA33-130304-F04	184
Μ	Mite	98% inhibited	45L	2	Panasonic Product Analysis Center	E02-080204IN-02	185
Mould	Aspergillus (Aspergillus genus)	93.9% inhibited	45L	2	Institute of Tokyo Environmental Allergy	11M-RPTMAR076_1	186
Animal	Dog (dander)	99.8% inhibited	45L	1	Institute of Tokyo	11M-RPTAPR047_1	187
Anii	Cat (dander)	98.6% inhibited	45L	2	Allergy	11M-RPTAPR051_1	188



4: Allergens

[Representative evidence]

*1 : Units based on Panasonic standards

		Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Mites	Dermatophagoides farinae	60% inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	BAA33-130304-F04	184
	Mite	98% inhibited	45L	2	Panasonic Product Analysis Center	E02-080204IN-02	185
Mould	Aspergillus (Aspergillus genus)	93.9% inhibited	45L	2	Institute of Tokyo Environmental Allergy	11M-RPTMAR076_1	186
Animal	Dog (dander)	99.8% inhibited	45L	1	Institute of Tokyo Environmental Allergy	11M-RPTAPR047_1	187
	Cat (dander)	98.6% inhibited	45L	2		11M-RPTAPR051_1	188

[Proven allergens with nanoe $^{\text{\tiny TM}}$ X]

Mites	Dermatophagoides farinae / Dermatophagoides pteronyssinus
Mould	Alternaria / Aspergillus / Candida / Malassezia
Animals	Dog (dander) / Cat (dander)
Insects	Cockroach / Moth
Tree and shrub pollen	Cedar / Cypress / Alnus japonica / Japanese white birch / Olive / Juniper / Casuarina
Grass pollen	Orchard grass / Timothy grass / Ragweed / Miscanthus / Artemisia / Humulus japonicus

[Proven allergens with nanoe $^{\text{\tiny M}}$]

Mites	Dermatophagoides farinae					
Mould	Aspergillus					
Animals	Dog (dander) / Cat (dander)					
Tree and shrub pollen	Cedar / Cypress					
Grass pollen	Orchard grass / Ragweed					

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What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

C•nanoe[™]X

Newly verified effects only nanoe™ X delivers

5: Pollen

*1 : Units based on Panasonic standards

Pollen Allergens	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Cedar	97% inhibited	Approx. 23m ³	8	Panasonic Product Analysis Center	4AA33-151001-F01	190
Cypress	Inhibited	Approx. 23m³	24			
Orchard grass	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	4AA33-151028-F01	191
Ragweed	Inhibited	Approx. 23m³	24			
Alnus japonica	Inhibited	Approx. 23m³	24			192
Japanese white birch	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	4AA33-160601-F01	
Artemisia	Inhibited	Approx. 23m³	24			
Olive	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center		193
Juniper	Inhibited	Approx. 23m³	24			
Casuarina	Inhibited	Approx. 23m³	24		4AA33-160601-F02	
Miscanthus	Inhibited	Approx. 23m³	24			
Timothy grass	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	4AA33-160701-F01	194
Humulus japonicus	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	1V332-180301-F01	195

[Further evidence]

*1 : Units based on Panasonic standards

	Pollen Allergens	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
_	Cedar	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	4AA33-151015-F01	196
	Cedar	99% inhibited	45L	2	Panasonic Product Analysis Center	E02-080303IN-03	198
	Cypress	Inhibited	45L	1	Shinshu University Faculty of Textile Science and Technology	-	199
	Ragweed	Inhibited	45L	1			
_	Orchard grass	Inhibited	45L	1			



5: Pollen

[Representative evidence]

*1 : Units based on Panasonic standards

Pollen Allergens	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Cedar	88% inhibited	Approx. 23m³	8	Panasonic Product Analysis Center	BAA33-130304-F01	200
Cypress	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	1V332-171010-F04	201
Orchard grass	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	1V332-171010-F02	202
Ragweed	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	1V332-171010-F01	203

[Further evidence]

*1 : Units based on Panasonic standards

Pollen Allergens	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer page
Cedar	Inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	1V332-171010-F03	204
Cedar	99% inhibited	45L	2	Panasonic Product Analysis Center	E02-080303IN-03	198
Cypress	Inhibited	45L	1	Shinshu University Faculty of Textile Science and Technology	-	199
Ragweed	Inhibited	45L	1			
Orchard grass	Inhibited	45L	1			

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting

Test reports

Odours

Bacteria

& viruses

Mould

Allergens

- -

Hazardous substances

substances (PM2.5)

> Dust (PM2.5)

Skin & hair

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C•nanoe[™]X

6: Hazardous substances (PM2.5)

Representative evidenc	:е ј
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*1 : Units based on Panasonic standards

Н	azardous substances		Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Pollutants	Paraffin (Hexadecane)	99% inhibited	Approx. 23m³	16	Panasonic Product Analysis Center	Y17NF089	206
	Aromatic carboxylic acid (Benzoic acid)	99% inhibited	Approx. 23m³	8	Panasonic Product Analysis Center	Y17NF096	207
	Benz [a] anthracene (BaA)	78% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF141	212
	Benzo [b] fluoranthene (BbF)	79% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF142	213
Carcinogen	Benzo [a] pyrene (BaP)	97% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF143	214
J	Indeno [1,2,3-cd] pyrene (IcP)	97% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF144	215
	Dibenzo [a,h] anthracene (Dha)	81% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF145	216

[Further evidence]

*1 : Units based on Panasonic standards

Н	azardous substances	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Pollutants	Paraffin (Hexadecane)	99% inhibited	Approx. 23m³	16	SGS-CSTC - Standards Technical		
	Aromatic carboxylic acid (Benzoic acid)	99% inhibited	Approx. 23m ³	8	Services Co., Ltd.	SHES160600431171	208
	Hexadecane	99.9% inhibited	Approx. 28m³	2	PT. ANUGRAH ANALISIS SEMPURNA	AAS.LHP. III.2018.0443.B	209
	Hexadecane	99% inhibited	Approx. 25m³	8	Institute for Scientific and Technological Research and Services of King Mongkut's University of Technology Thonburi	-	210
	Benz [a] anthracene (BaA)	80% inhibited	36L	8	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	
_	Benzo [b] fluoranthene (BbF)	70% inhibited	36L	8			208
Carcinogen	Benzo [a] pyrene (BaP)	99% inhibited	36L	8			
	Indeno [1,2,3-cd] pyrene (IcP)	80% inhibited	36L	8			
	Dibenzo [a,h] anthracene (Dha)	72% inhibited	36L	8			

C•nanoe[™]

6: Hazardous substances (PM2.5)

[Representative evidence]

*1 : Units based on Panasonic standards

H			Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Pollutants	Paraffin (Hexadecane)	99% inhibited	Approx. 23m³	24	Panasonic Product Analysis Center	Y13NF136	218
	Aromatic carboxylic acid (Benzoic acid)	99.9% inhibited	Approx. 23m³	16	Panasonic Product Analysis Center	Y13NF135	219
Carcinogen	Benz [a] anthracene (BaA)	78% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF141	212
	Benzo [b] fluoranthene (BbF)	79% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF142	213
	Benzo [a] pyrene (BaP)	97% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF143	214
	Indeno [1,2,3-cd] pyrene (IcP)	97% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF144	215
	Dibenzo [a,h] anthracene (Dha)	81% inhibited	36L	8	Panasonic Product Analysis Center	Y13NF145	216

[Further evidence]

*1 : Units based on Panasonic standards

H	Hazardous substances	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Pollutants	Paraffin (Hexadecane)	99% inhibited	Approx. 23m³	24	SGS-CSTC - Standards Technical	SHES160600431171	220
Pollu	Aromatic carboxylic acid (Benzoic acid)	99% inhibited	Approx. 23m³	16	Services Co., Ltd.		220
	Benz [a] anthracene (BaA)	80% inhibited	36L	8		SHES160600431171 SHES160600431171	
<u>_</u>	Benzo [b] fluoranthene (BbF)	70% inhibited	36L	8			
Carcinogen	Benzo [a] pyrene (BaP)	99% inhibited	36L	8	SGS-CSTC Standards Technical Services Co., Ltd.		220
S	Indeno [1,2,3-cd] pyrene (IcP)	80% inhibited	36L	8			
	Dibenzo [a,h] anthracene (Dha)	72% inhibited	36L	8			

C•nanoe'X C•nanoe-G



6: Hazardous substances (PM2.5)

[Further evidence]

*1 : Units based on Panasonic standards

Hazardous substances	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Benzoic acid	99% inhibited	Approx. 23m³	4	Temasek Polytechnic	TASF_QS_61/17/18	222
Decane	99.67% inhibited	Approx. 24m³	2	Environmental Technology	1159216-U	223
Hexadecane	99.94% inhibited	Approx. 24m	8	Research Centre SIRIM Berhad	1159216-0	223

Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe™ X and nanoe™ inhibit activity or growth of viruses,

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of

Effects of

nanoe™

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances

(PM2.5) Dust

(PM2.5)

Skin & hair

C•nanoe[™]X

Newly verified effects only nanoe™ X delivers

7: Skin and hair

[Representative evidence]

*1 : Units based on Panasonic standards

Skin and hair	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
QL:	Effective	Approx. 34m³	1	Panasonic Product Analysis Center	USG-KT-14K-012-TM	224
Skin	Effective	Standard household	28 days	FCG Research Institute, Inc.	19104	228
Hair	Effective	Approx. 46m ³	8 Hr. × 15 days	Panasonic Product Analysis Center	USD-KS-15S-009-TM	225

[Further evidence]

*1 : Units based on Panasonic standards

Skin and hair	Result ^{*1}	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Clrim	Effective	Approx. 34m³	SGS-CSTC Standards Technical SHES16060043	CUEC46060040474	006	
Skin	Confirmation of hydrophilicity	3cm	5 mins.	Standards recrinical Services Co., Ltd.	SHES1606004311/1	226
Hair	Effective	Approx. 46m³	8 Hr. × 15 days	SGS-CSTC Standards Technical Services Co., Ltd.	SHES160600431171	227

C•nanoe e

7: Skin and hair

[Representative evidence]

*1: Units based on Panasonic standards

Skin and hair	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
QU.	Effective	Approx. 46m³	1	Panasonic Product Analysis Center	D01-071219F-01	229
Skin	Effective	Standard household	28 days	FCG Research Institute, Inc.	19104	228
Hair	Effective	Approx. 46m³	8 Hr. × 15days	Panasonic Product Analysis Center	D01-091005-01TM	229

[Further evidence]

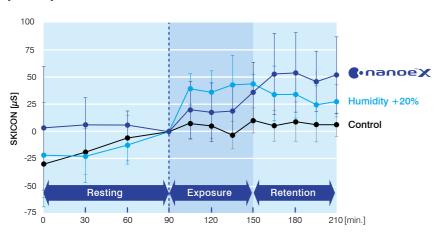
Skin and hair	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Skin	Confirmation of hydrophilicity	3cm	5 mins.	SGS-CSTC	SHES160600431171	230
Hair	Effective	Approx. 46m ³	8 Hr. × 15 days	Standards Technical Services Co., Ltd.	SHES100000431171	231

*1: Units based on Panasonic standards

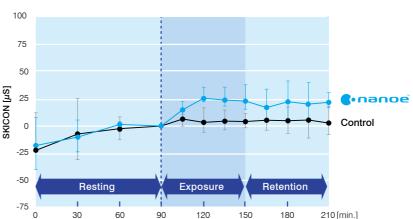
ation	Report No.	Refer to page
nical	SHES160600431171	230
.td.		231

Test





[Effects]*2



Individual results may vary based on usage, and seasonal and environmental variables (temperature and humidity).

What is nanoe™ Technology? What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

^{*1 [}Testing organisation] Panasonic Product Analysis Center [Testing method] Rest period: 90 minutes, nanoe™ exposure time: 60 minutes, retention: 60 minutes. 8 women aged 30~49 with dry to normal skin. [Test result] Change in skin moisture content equivalent to a 20 percentage point increase from 30% --> 50% in environmental humidity (USG-KT-14K-012-TM)

^{*2 [}Testing organisation] Panasonic Product Analysis Center [Testing method and test result] Approximately 34m³ sized test room, room temperature 23 degrees Celsius, humidity 30%, 8 women aged 30~49 with varying skin conditions ranging from being averagely moist to dry, the stratum corneum water content was measured before and after resting for 90 minutes being exposed to a nanoe™ generating device, to find the average value of the change. (D01-071219F-01)

C•nanoe-G

*1 : Units based on Panasonic standards

	Substance name	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Adhered	Cigarette smoke odour	Odour intensity reduced by 1 level [compared to non- operation]	20m³	2	OMI ODOR AIR SERVICE Co., Ltd.	13-1204	232

Bacteria & viruses

*1 : Units based on Panasonic standards

	Substance name	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Airborne	Staphylococcus aureus NBRC 12732	Removed by 99% [compared to the initial concentration]	25m³	2.5	Kitasato Research Center for Environmental Science	23_0182	233
Adhered	Staphylococcus aureus subsp. Aureus NBRC 12732	Removed by 99% [compared to the original condition/ventilation mode]	10m³	24	Japan Food Research Laboratories	11047933001-02	234
	Escherichia coli phage [ΦΧ-174 ATCC 13706-B1]	Removed by 99% [compared to the initial concentration]	200L	5 mins.	Kitasato Research Center for Environmental Science		
Airborne		Removed by 99% [compared to the initial concentration]	25m³	2	Kitasato Research Center for Environmental Science	22_0008	235
	Influenza [H1N1] 2009 virus	Removed by 99% [compared to the initial concentration]	200L	5 mins.	Kitasato Research Center for Environmental Science		
Adhered	Bacteriophage [ΦX-174 NBRC 103405]	Removed by 99% [compared to non- operation]	90L	2	Japan Food Research Laboratories	11073649001-02	236

Bacteria & viruses (In-filter)

*1 : Units based on Panasonic standards

	Substance name	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Bacteria	Staphylococcus aureus subsp. Aureus NBRC 12732	Removed by 99% [compared to non- operation]	Вох	2	Japan Food Research Laboratories	12037932001-02	237
Ø	Bacteriophage [ΦX-174 NBRC 103405]	Removed by 99% [compared to non- operation]	Вох	2	Japan Food Research Laboratories	12014705001-02	238
Viruses	Influenza [H1N1] 2009 virus	Removed by 90% [compared to non-operation (nanoe-G)] [The percentage varies from 78.9% to 96.1%, depending on its location on filter.]	0.2m ³	2	Kitasato Research Center for Environmental Science	24_1013	239

*1 : Units based on Panasonic standards

	Substance name	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Airborne	Penicillium pinophilum NBRC 6345	Removed by 99% [compared to non- operation]	25m³	1.5	Kitasato Research Center for Environmental Science	23_0140	240
Adhered	Cladosporium cladosporioides NBRC 6348	Removed by 85% [compared to non- operation] [average >85% after 7 days.]	1m³	7 days	Japan Food Research Laboratories	11047937001-02	241

Dust (PM2.5)

	Substance name	Result*1	Capacity	Time (Hr.)	Testing organisation	Report No.	Refer to page
Airborne	Cigarette smoke [as PM2.5]	Removed by 99% [compared to the initial concentration]	23m³	202 mins.	FCG Research Institute, Inc.	25034	242

*1 : Units based on Panasonic standards

Hazardous

Dust (PM2.5)

substances (PM2.5)

What is nanoe™

Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Test reports

Odours

Bacteria

& viruses

Mould

Allergens

Skin & hair

Deodorisation effect varies according to the environment (temperature and humidity), operation time, odour, and fabric types. It does not eliminate toxic substances in cigarettes (carbon monoxide, etc.). Odours that are continuously generated (e.g., building material odours and pet odours) are not completely eliminated. Results may vary based on usage, and seasonal and environmental variables (temperature and humidity). nanoe-G inhibit activity or growth of viruses, but do not prevent infection.



Newly verified effects only nanoe™ X delivers

Specifications

	Test items Test Conditions	Testing organisation	Report No.	Refer to page
Amount of OH radicals	Large amount of OH radical Generating more than 4.8 trillion particles per second.	- SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	244
	Measured by: ESR			
	nanoe™ X contains 10 times more OH radicals than nanoe™			
	• Comparison with nanoe™ • Measured by: ESR [480 billion per second] and nanoe™ X [4.8 trillion per second]			
pH value	Slightly acidic Similar to human skin.	SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	244
	Measured by: pH meter pH value: 5.0 +/- 0.5			
Size	Nanometer size (5 - 20nm)* * 1m, nanometer, is 1/ 1 billion meter			
	• Test equipment: DMA • Particle diameter • nanoe™ X: 5 - 20nm • negative ion: 0.5 - 1.5nm			
Moisture content	Higher moisture 1,000 times more water is contained than the general negative ion.			
	• Test equipment: DMA			
Lifespan	Long-lasting/existence Approx. 6 times longer compared with general ion. Able to reach 10 meters ahead.	SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	245
	Test equipment Particle diameter nance™ X: CPC negative ion: FCE			



Specifications

	Test items Test Conditions	Testing organisation	Report No.	Refer to pag
Amount of OH radicals	Large amount of OH radical Generating more than 480 billion particles per second.	SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	246
	Measured by: ESR			
pH value	Slightly acidic Similar to human skin.	SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	
	Measured by: pH meter PH value: 5.0 +/- 0.5			
Size	Nanometer size (5 - 20nm)* * 1m, nanometer, is 1/ 1 billion meter			
	• Test equipment: DMA • Particle diameter • nanoe™ : 5 - 20nm • negative ion: 0.5 - 1.5nm			
Moisture content	Higher moisture 1,000 times more water is contained than the general negative ion.			
	Test equipment: DMA Particle diameter nanoe™ : 5 - 20nm negative ion: 0.5 - 1.5nm * Calculated diameter			
Lifespan	Long-lasting/existence Approx. 6 times longer compared with general ion. Able to reach 10 meters ahead.	SGS-CSTC Standards Technical Services Co., Ltd.	SHES 160600431171	247
	• Test equipment • Particle diameter • nanoe™ : CPC • negative ion: FCE			

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances

(PM2.5)

Dust (PM2.5)

7

Test reports overview - relevant certificates and cover pages

What is nanoe™ Technology?

What are nanoe™ X and

Effects of nance™ X

Effects of

Effects of nanoe-G

Compilation of supporting

Test reports

Odours

Bacteria

Mould

...

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

III & IIali



Odours Cigarette smoke odour

Panasonic

アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160615-N04

件名: 10倍ナノイー タバコ臭脱臭試験

2016年 6月 15日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







Odours BBQ odour

Panasonic

アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 4AA33~151221-N01

件名:ナノイー焼き肉臭脱臭試験

2015年 12月 22日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous

substances (PM2.5)

(PM2.5)

Skin & hair



Odours Pet odour

Panasonic

アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160315-A34

件名: ナノイーペット臭脱臭試験

2016年 3月 11日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://jweb.mei.co.jp/cont/sec/







Odours Sweat odour (hexanoic acid)

Panasonic

アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 4AA33-160315-A35

件名:ナノイー汗臭脱臭試験

2016年 3月 11日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology?

nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous

substances (PM2.5)

(PM2.5)

Skin & hair



Odours Sweat odour (nonanoic acid)

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

分析 · 解析結果報告書

報告書番号:Y16HM016

件名:ナノイー汗臭脱臭試験

2016年6月23日

パナソニック株式会社 プロダクト解析センター 材料ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:050-3153-1648 http://iweb.mei.co.jp/cont/aec/





Odours Damp odour (triethylamine)

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

分析 · 解析結果報告書

報告書番号:Y16RA002

件名:ナノイーによる生乾き臭の脱臭試験

2016年4月4日

パナソニック株式会社 プロダクト解析センター 材料ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:050-3153-1648 http://iweb.mei.co.jp/cont/aec/







What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous

substances (PM2.5)

(PM2.5)



Odours Garbage odour (methylmercaptan)

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 1V332-18220-K11

件名:ナノイーX 生ゴミ臭の脱臭試験 (メチルメルカプタン)

2018年 2月 20日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mel.co.jp/cont/aec/







Odours Garbage odour (trimethylamine)

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 1V332-180220-K12

件名:ナノイーX 生ゴミ臭の脱臭試験 (トリメチルアミン)

2018年 2月 20日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances

(PM2.5)

(PM2.5)

Skin & hair



Odours Durian odour

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第四部 第一課

試験報告書

報告書番号: 1V332-180402-K01

件名:ナノイーXの消臭試験(ドリアン臭)

2018年7月30日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







Odours Cigarette smoke odour, BBQ odour, Pet odour, Sweat odour, Damp odour (triethylamine)



Product name

Applicant Address

Testing place

Report issue date Test Requirement and result **Testing Report**

nanoe X---nanoe 16X & nanoe 17X

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District,

Panasonic Product Analysis Center/KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

1. Deodorization effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces remarkable effect upon odor removal. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nanoe 17X and nanoe 16X are of the same nature. it is proved too that nanoe 16X can produce remarkable effect on ordor

Test conclusion: The difference of Cigarette oddor intensity with blank is 1.5 or more after 12 minutes. Compared with the data of nanoe in report number SHES160600431171-1-2-1 (The difference of Cigarette oddor intensity with blank is 1.5, after 120 minutes), The deodorizing speed of Cigarette Odors of nanoe X (16X &17X) is 10 times that of

2. Bacteria inactivation effect of nanoe 16X and nanoe 17X Test conclusion: Bacteria inactivation rate of nanoe 17X (staphylococcus aureus) is 99.91%. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have provide that nanoe 17X and nance 16X are of the same nature, it is proved to that nance 17X and nance 16X can achieve the same bacteria inactivation effect. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1 (Bacteria inactivation rate is 99.76%), The inactivation effect of nanoe X (16X &17X) is much more effective than that of nance.

3. Allergen inactivation effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces remarkable inactivation effect of Allergen Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nanoe 17X and nanoe 16X are of the same nature, it is proved too that nanoe 17X and nanoe 16X have the same inactivation effect.

Test conclusion: The inactivation of pollen allergen, achieving 99.1% inactivation percentage. Compared with the data of nance in report number SHES160600431171-1-2-1 (The inactivation of pollen allergen, achieving 87.4% inactivation percentage), T The inactivation effect of nanoe X (16X &17X) is much more effective than that of

Page 1 of 43

Member of the SGS Group (SGS SA)

Report No.: SHES160600431171-4-1-1 Date: 2018-04-10

> What are nanoe[™] X and nanoe™ ?

What is nanoe™

Technology?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair



Odours Scalp odour (pillow cover)

平成 26 年度 共同研究報告書

帯電微粒子水(ナノイー)による 実空間臭に対する効果の検証

平成 27 年 3 月

大同大学 におい・かおり研究センター 光田 Odours Cigarette smoke odour

パナソニック電工解析センター(株)

<u>管理番号 E02-090313MH-01</u>

パナソニック電工株式会社 電器R&Dセンター メカトロデバイス技術開発G

結果報告書

件名:タバコ付着臭に対する消臭性能評価

2009年 3月 30日

パナソニック電工解析センター株式会社 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-1269 FAX 06-6906-2202



What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

> > Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)





Odours Garbage odour (methylmercaptan)

拠松下電工解析センター

<u>管理番号 E02-080219MH-01</u>

松下電工株式会社 電器デバイス開発事業部 デバイス開発G

結果報告書

件名:付着臭(MM)に対するnanoeの消臭性能評価

2008年 2月 27日

株式会社松下電工解析センター 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

> TEL 06-6906-1269 FAX 06-6906-2202



Odours Pet odour

平成 23 年度研究報告書

委託団体:パナソニックエコシステムズ株式会社

研究テーマ:帯電微粒子水(ナノイー)による

ペット臭に対する効果の検証

大同大学

におい・かおり研究センター

光田

2012年3月

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)



Odours Cigarette smoke odour

管理番号 BAA33-130125-D01

アプライアンス社 ホームアプライアンス開発センター 開発第三グループ 第二チーム

結果報告書

件名:nanoe付きエアコンの消臭試験

2013年2月4日

パナソニック株式会社 解析センター 信頼性サポートグループ 信頼性解析チーム

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-0163 FAX 06-6906-3732







Odours Garbage odour (methylmercaptan)

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 1V332-180316-K21

件名:ナノイー 生ゴミ臭の脱臭試験 (メチルメルカプタン)

2018年 3月 16日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous

substances (PM2.5)

Dust (PM2.5)

Skin & hair



Odours Garbage odour (trimethylamine)

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 1V332-180316-K22

件名:ナノイー 生ゴミ臭の脱臭試験 (トリメチルアミン)

2018年 3月 16日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/





Odours Cigarette smoke odour



Product name

Applicant Address

Testing place

Report issue date
Test Requirement and result

Testing Report

1. nanoe--nanoe 4S & nanoe 3S

2. nanoe-G--nanoe-G

(Refer to Appendix for details on specific commodity models carried by the device)

Report No.: SHES160600431171-2-1-1

Date: 2018-04-10

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District, Shanghai

Panasonic Product Analysis Center /KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

- Deodorization effect of nance 4S and nance 3S
 Test conclusion: nance 3S produces remarkable effect upon odor
 removal. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1
 have proved that nance 4S and nance 3S are of the same nature, it is
 proved too that nance 4S can produce remarkable effect on ordor
 removal.
- Bacteria inactivation effect of nanoe 4S and nanoe 3S
 Test conclusion: Bacteria inactivation rate of nanoe 3S
 (staphylococcus aureus) is 99.76%. Test items1, 2, 3, 4 and 5 of
 report SHES160600431171-1-1-1 have provide that nanoe 4S and
 nanoe 3S are of the same nature, it is proved to that nanoe 4S and
 nanoe3S can achieve the same bacteria inactivation effect.
- 3. Pollen allergen inactivation effect nanoe 4S and nanoe 3S Test conclusion: nanoe 3S has a remarkable inactivation of pollen allergen, achieving 87.4% inactivation percentage. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1 have proved too that nanoe 4S and nanoe 3S are of the same nature, it is proved too that nanoe 4S and nanoe3S have the same inactivation effect.
- 4. Mold inactivation effect of nanoe 4S and nanoe 3S Test conclusion: nanoe 3S produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1. have proved nanoe 4S and nanoe 3S are of the name nature, it is proved too that nanoe 4S can produce remarkable inactivation effect on mold.
- Effect of nanoe 4S and nanoe 3S upon on hair settlement
 Test conclusion: nanoe 4S and nanoe 3S-treated hair is more
 smooth and hangs down more easily.
 Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have
 proved that nanoe 4S and nanoe 3S are of the same nature

Page 1 of 84

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Member of the SGS Group (SGS SA)

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

107



Bacteria & viruses Bacteria staphylococcus aureus

2016_40279

To Panasonic Corporation

Test Report

Evaluation test of the removal efficacy of Test device (made by P company) on airborne bacteria (25 m^3 space)

KRCES · Bio. Test Report No.2016_0279

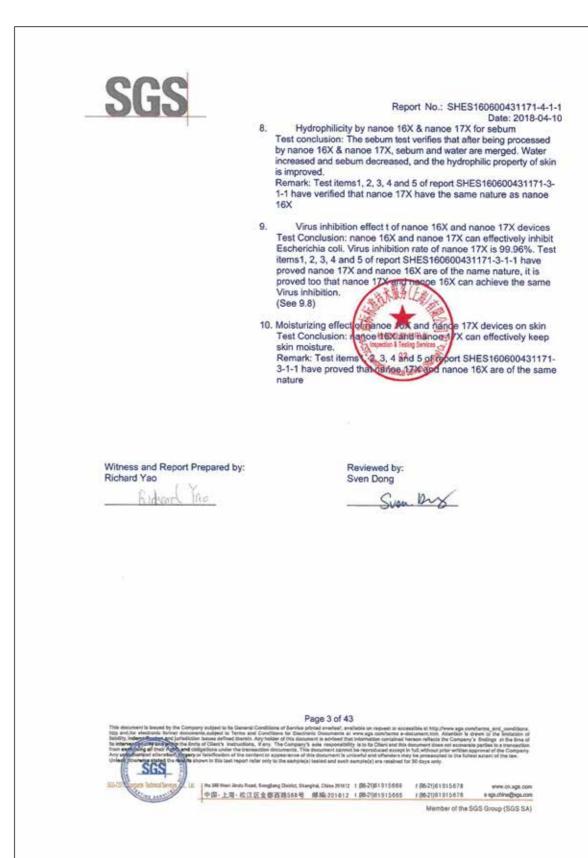
December 14, 2016

Approved by: Toshehin Hoh

Toshihiro Itoh, Chief Director Kitasato Research Center for Environmental Science 1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

The contents of this report should not be disclosed to the public without prior consent of the Kitasato Research Center for Environmental Science. The test results shown here are applied to only test samples and do not guarantee quality of the whole batch (lot) of the test material.

Bacteria & viruses Virus bacteriophage ΦΧ174



What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

& viruses

Allergens

Delles

Hazardous substances

(PM2.5)

(PM2.5)



Bacteria & viruses Bacteria staphylococcus aureus



Product name

Applicant Address

Testing place

Report issue date

Test requirement and result

Report No.: SHES160600431171-3-1-1 Date: 2018-04-10

Testing Report

nanoe X---nanoe 16X & nanoe 17X

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District,

Panasonic Product Analysis Center/KANAZAWA University NM Research Laboratory

Test items requested by the customer

- 1. Measurement of Hydroxyl radical (OH radical amount in the particles occurred in nanoe 16X and nanoe 17X) Test conclusion: Average OH occurrence speed of nanoe 16X is 651.4×1010 spin/s. Average OH occurrence speed of nanoe 17X is $656.9\!\times\!10^{10}$ spin /s. Compared with the data of nanoe 4S in report number SHES160600431171-1-2-1 (65.4 x 1010 /s), the average OH speed of nanoe 16X and nanoe 17X is ten times of nanoe 4S.
- 2. Measurement of PH value of the particles occurred in nanoe 16X and nanoe 17X
 - Test conclusion: Average PH value of nanoe 16X is 5.37, and average PH value of occurrence particles of nanoe 17X is 5.29, both in the range of 5.0±0.5, subacidity.
- 3. Diameter of particles occurred in nance 16X, nance 17X Test conclusion: to prove that the diameter of occurrence particles of nanoe 16X and nanoe 17X is in the range of 5nm-

As earlier test items 3 have proved that the diameter of nance 16X and nanoe 17X is in the range of 5nm-20nm, and test items 3 of report SHES160600431171-1-1-1 have proved that the diameter of negative ion is in the range of 0.5nm-2nm, it is proved too that the moisture of nanoe is 1,000 times more water content than the general negative ion

4. Existence of water ion (water content) in the particles occurred in nance 16X and nance 17X

Test conclusion: to prove that occurrence particles of nanoe 16X and nanoe 17X devices contain plenty of water content.

Page 1 of 24

Member of the SGS Group (SGS SA)

Bacteria & viruses Influenza virus (H1N1 subtype)



第 16099930002-0101 号 page 1/3 2016年(平成 28年)10月11日

試験報告書

依 頼 者 パナソニック株式会社



ナノイーXデバイス[ボックス(大きさ:350mm×350mm×400mm)]

ウイルス不活化試験

2016年(平成28年)09月12日当センターに提出された上記検体について試験した結果をご報告いたします。

水幅作的を他に掲載するときはるセンターの掲載剤的をお守りください。 日本食品分析センター What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

> > nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances

(PM2.5) Dust

(PM2.5)

Skin & hair



Bacteria & viruses Influenza viruses



STUDY REPORT

EVALUATION OF THE SUPPRESSING EFFECT OF THE PANASONIC AIR CONDITIONER ON A/H3N2 INFLUENZA VIRUSES

July 24, 2017

Page 1 of 12

What is nanoe™
Technology?

What are
nanoe™ X and
nanoe™?

Effects of
nanoe™ X

Effects of
nanoe™
Compilation
of supporting
evidence

Odours

Bacteria & viruses

Mould

Allergens

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)





Bacteria & viruses Virus bacteriophage ΦX174

244120/24_0300_1

To Panasonic Corporation

Test Report

Evaluation test of the inactivation on airborne virus $(25 \text{ m}^3 \text{ space})$

> KRCES · Bio. Test Report No.24_0300_1 February 5, 2013

Approved by: Toshihir Itoh

Toshihiro Itoh, Chief Director Kitasato Research Center for Environmental Science

1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

The contents of this report should not be disclosed to the public without prior consent of the Kitasato Research Center for Environmental Science. The test results shown here are applied to only test samples and do not guarantee quality of the whole batch (lot) of the test material.

Bacteria & viruses Virus bacteriophage ΦX174



第 13001265005-01 号 page 1/5 2013年(平成25年)02月11日

パナソニック株式会社



nanoe+送風装置

付着ウイルスに対する抑制性能評価試験

2013年(平成25年)01月10日当センターに提出された上記検体について試験した結果をご報告いたします。

本程告書を他に掲載するときは当センターの掲載規約をお守りください。

日本食品分析センター

What is nanoe™ Technology?

> What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Odours

Bacteria & viruses

Allergens

Hazardous (PM2.5)

(PM2.5)



Bacteria & viruses Bacteria staphylococcus aureus



第 13044083003-01 号 page 1/3 2013年(平成25年)06月14日

試 験 報 告 書

依 賴 者 パナソニック株式会社



検 体 nanoe+送風装置

表 題 除菌効果試験

2013年(平成25年)05月31日当センターに提出された上記検体について試験した結果をご報告いたします。

本権会界を他に掲載するときは者センターの掲載規約をお守りください。 - 総制電法 日本食品分析センター Bacteria & viruses Influenza virus (H1N1 subtype)

 $217084 \diagup 21_0084_1$

パナソニック電工株式会社 パナソニック株式会社 パナソニック エコシステムズ株式会社 殿

試 験 報 告 書

nanoe のウイルスに対する除菌性能評価試験

北環発 21_0084_1 号 平成 21 年 10 月 16 日

神奈川県相模原市北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊 藤 俊 洋

試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり 荷口(ロット)全体の品質を証明するものではありません。 What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

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Mould

Allergens

Pollen

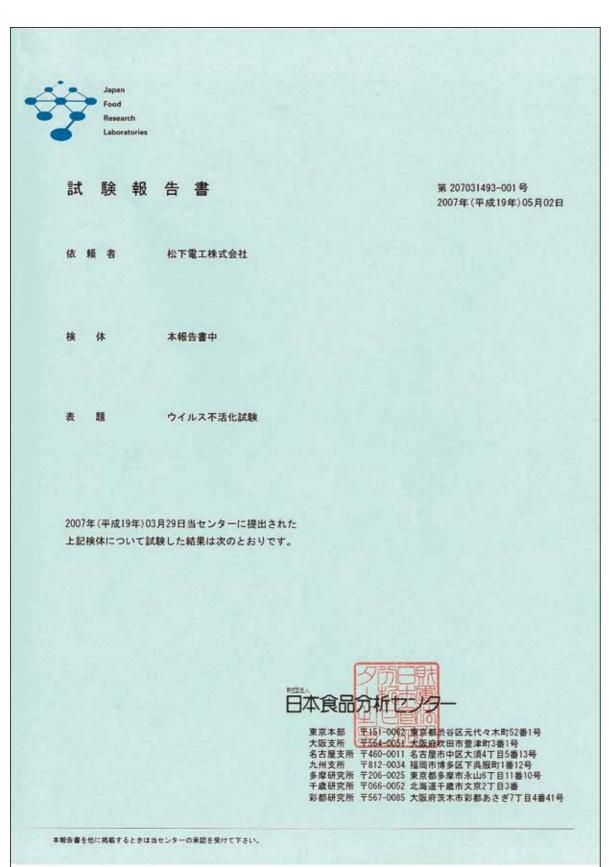
Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair



Bacteria & viruses Feline calicivirus (related form of norovirus)



Bacteria & viruses Coxackievirus (B6)

227085/22_0085 パナソニック電工株式会社 殿 試験報告書 ナノイーデバイスによる付着コクサッキーウイルスの 除去性能試験 (45L ボックス) 北環発 22_0085 号 平成 23 年 3 月 18 日 神奈川県相模原市南区北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊洋 試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。

What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of

> nanoe™ Effects of

nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)





Bacteria & viruses Poliovirus type 1 (Lsc-2ab)

2270096/22_0096

パナソニック電工株式会社 殿

試験報告書

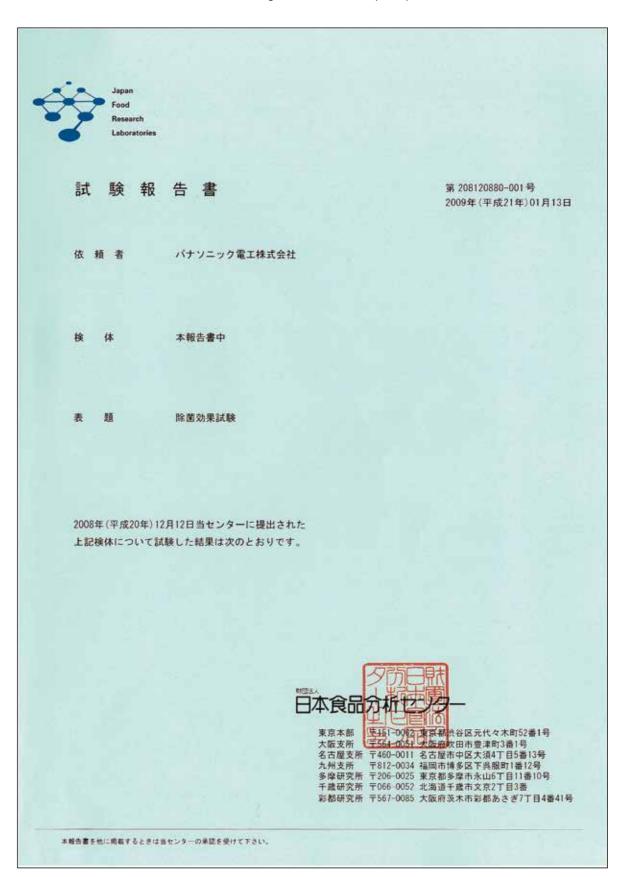
ナノイーデバイスによる付着ポリオウイルスの 除去性能試験(45L ボックス)

> 北環発 22_0096 号 平成23年4月1日

神奈川県相模原市南区北里1丁目15番1号 財団法人 北里環境科学センター 伊藤俊湛

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Bacteria & viruses Bacterium enterohemorrhagic escherichia coli (O157)



What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

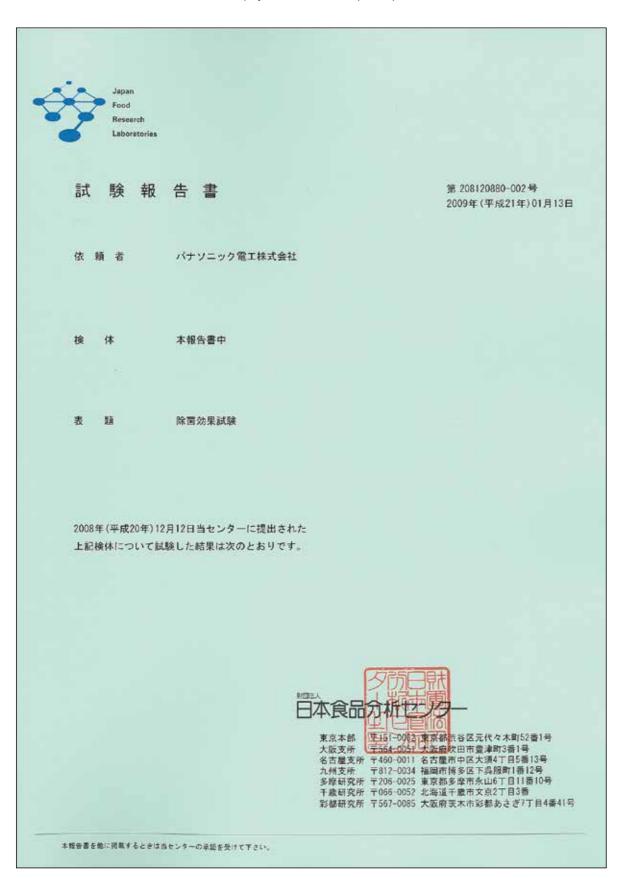
Hazardous

substances (PM2.5)

(PM2.5)



Bacteria & viruses Methicillin-resistant staphylococcus aureus (MRSA)



Bacteria & viruses Staphylococcus aureus

204032/20_0154_2

パナソニック株式会社 ホームアプライアンス社 殿

試験報告書

ナノイーイオンの付着菌・付着カビに対する浸透除菌性能評価試験

北生発 20_0154_2 号 平成 20 年 10 月 31 日

神奈川県相模原市北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊洋

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What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Bacteria & viruses Bacillus



第 11000924001-01 号 2011年(平成23年)02月01日

試 験 報 告 書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)01月06日当センターに提出された上記検体について試験した結果をご報告いたします。

本権告書を他に掲載するときは当センターの掲載場向をお守りください。

日本食品分析センター

Bacteria & viruses Micrococcus



第 11000924001-02 号 2011年(平成23年)02月01日

試験報告書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

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日本食品分析センター

What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

> > Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

5...



Bacteria & viruses Serratia



第 11000924001-03 号 2011年(平成23年)02月01日

試験報告書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)01月06日当センターに提出された上記検体について試験した結果をご報告いたします。

木後吉舎を他に掲載するときは当センターの掲載規約をお守りください。

日本食品分析センター

Bacteria & viruses Kocuria



第 11000922001-01 号 2011年(平成23年)03月07日

試 験 報 告 書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)01月06日当センターに提出された上記検体について試験した結果をご報告いたします。

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日本食品分析センター

What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Polleri

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair





Bacteria & viruses Bjerkandera adustra (kosa)

平成 25 年 3 月 29 日

パナソニック株式会社 殿

静電霧化微粒子水(ナノイー)による黄砂付着真菌・細菌 の不活化効果検証実験

報告書

金沢大学 理工研究域 物質化学系

准教授 牧



1/3

Bacteria & viruses Bird flu virus (H5N1 and H9N2 subtypes)

パナソニック電工株式会社 殿

試験報告書

帯電微粒子水のインフルエンザウイルスの形態に及ぼす影響

平成22年3月30日

大動物特殊疾病研究センター・特定疾病分野 小小川

What is nanoe™ Technology? What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

(PM2.5)



Bacteria & viruses Swine-origin influenza virus (A/Narita/2009(H1N1)pdm)

パナソニック電工株式会社 殿

試験報告書

帯電微粒子水の新型インフルエンザウイルスに 対する作用についての試験報告

平成 21 年 10 月 9 日

帯広畜産大学 大動物特殊疾病研究センター 特定疾病分野 今井 / 小川 Bacteria & viruses Bacteriophage ΦX174

214053/21_0143_4

パナソニック電工株式会社 殿

試験報告書

nanoe 発生装置による付着ウイルス (バクテリオファージ) に対する不活化性能評価試験
(10 m ³循環式)

北生発 21_0143_4 号 平成 21 年 9 月 14 日

神奈川県相模原市北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊洋

試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。 What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Allergens

Pollon

Hazardous

substances (PM2.5)

(PM2.5)





Bacteria & viruses Encephalomyocarditis virus, Porcineparvo virus, Xenotropic murine leukemia virus, Pseudororabies virus

charles river

Appendix to Final Report

K1/P20/11

Charles River Biopharmacetical Services GmbH, D-51105 Köln Page 1 of 9

Bacteria & viruses Feline corona virus

パナソニック株式会社 殿

静電霧化微粒子水(nanoe)による 猫コロナウイルスに対する不活化能の検討

報告書

山口大学農学部 獣医微生物学教室

教授 前田

What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of

平成 24 年 2 月 1 日

Effects of

nanoe™

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

134





Bacteria & viruses Canine adeno virus

平成 24 年 2 月 1 日

パナソニック株式会社 殿

静電霧化微粒子水(nanoe)による 犬アデノウイルスに対する不活化能の検討

報告書

山口大学農学部 獣医微生物学教室

教授 前田



Bacteria & viruses Canine distemper virus

パナソニック電工株式会社 殿

試験報告書

nanoe 発生装置による犬ジステンパーウイルスに対する 不活化性能評価試験

平成 22 年 5 月 10 日

北海道江別市文京台緑町582番地 酪農学園大学 獣医学部

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair



Bacteria & viruses Canine parvovirus

パナソニック電工株式会社 殿

試験報告書

nanoe 発生装置による犬パルボウイルスに対する 不活化性能評価試験

平成 21 年 9 月 25 日

北海道江別市文京台緑町582番地 酪農学園大学 獣医学部

Bacteria & viruses Canine herpesvirus

パナソニック電工株式会社 殿

試験報告書

nanoe 発生装置による犬ヘルペスウイルスに対する 不活化性能評価試験

平成 22 年 3 月 13 日

北海道江別市文京台緑町582番地 酪農学園大学 獣医学部 桐澤

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)





Bacteria & viruses Bacterium enterohemorrhagic escherichia coli (O157)

🔆 eurofins Report No.: 2010/456-3 SAMi Rev.2 English Version: **Test Facility** 1 of 6 biolab Nov 3rd 2010

Final Report 2010/456-3 SAMi Rev.2

EVALUATION OF SANITIZING EFFICACY OF NANO-SIZE ELECTROSTATIC ATOMIZED WATER PARTICLE

Study Program No:

2010/456 SAMi

Contract No:

PARA201001080

Sponsor:

Panasonic Electric Works Co., Lt

Hans-Pinsel-Str. 2

85540 Haar, Germany

Test item:

NANO-SIZE ELECTROSTATIC ATOMIZED WATER

PARTICLE

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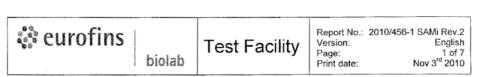
Eurofins Biolab S.r.I.

Società con Socio unico sottoposta a direzione e coordinamento della società Tel. + 39-022507151 Eurofins Scientific Italia S.r.l. parte di Eurofins Scientific Group http://pharma.eurofins.com/

Via Bruno Buozzi, 2 20090 Vimodrone (MI) - Italia Fax + 39-0225071599 biolab@eurofins.com www.eurofins.it www.biolab.it

C SOC € 100 000 iv P. IVA 00762140960 03765750157 C.F. REA MI 966696 D-U-N-S 429117112 CIT005 4-385

Bacteria & viruses Methicillin-resistant staphylococcus aureus (MRSA)



Final Report 2010/456-1 SAMi Rev.2

EVALUATION OF SANITIZING EFFICACY OF NANO-SIZE ELECTROSTATIC ATOMIZED WATER PARTICLE

Study Program No:

2010/456 SAMi

Contract No:

PARA201001080

Sponsor:

Panasonic Electric Works Co., Lt

Hans-Pinsel-Str. 2 85540 Haar, Germany

Test item:

NANO-SIZE ELECTROSTATIC ATOMIZED WATER

PARTICLE

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Eurofins Biolab S.r.l. Società con Socio unico sottoposta

a direzione e coordinamento della società Tel. + 39-022507151 Eurofins Scientific Italia S.r.l. parte di Eurofins Scientific Group http://pharma.eurofins.com/

Via Bruno Buozzi, 2 20090 Vimodrone (MI) - Italia Fax + 39-0225071599

biolab@eurofins.com www.eurofins.it www.biolab.it

C.SOC. € 100.000 i.v. P. IVA 00762140960 03765750157 REA MI 966696 D-U-N-S 429117112 CIT005 4-385

What is nanoe™ Technology?

> What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

Dust (PM2.5)





Bacteria & viruses Escherichia coli

松下電工株式会社 電器R&Dセンター メカトロデバイス技術開発G 御中 管理番号 E02-080303IN-01

結果報告書

件名:nanoeによる抗菌試験

2008年 3月 14日

株式会社松下電工解析センター 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

> TEL 06-6906-1269 FAX 06-6906-2202



Bacteria & viruses Staphylococcus aureus

パナソニック電工株式会社 電器R&Dセンター 御中 管理番号 E02-090701IN-01

結果報告書

件名:nanoeの除菌試験(3畳)

2009年 7月 31日

パナソニック電工解析センター株式会社 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

> TEL 06-6906-1269 FAX 06-6906-2202





nanoe™ ? Effects of nanoe™ X

nanoe™ X and

What is nanoe™ Technology?

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Allergens

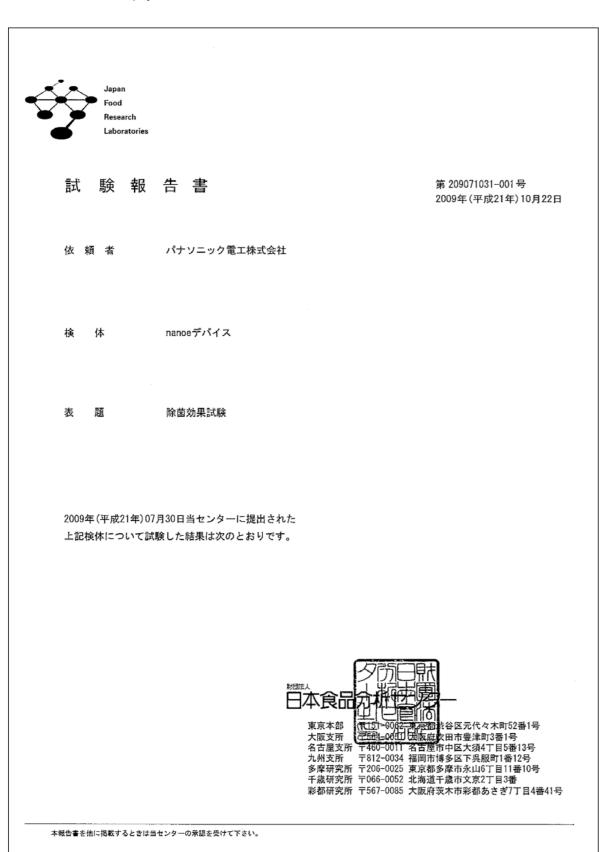
Hazardous substances (PM2.5)

(PM2.5)

Skin & hair



Bacteria & viruses Staphylococcus aureus



Bacteria & viruses Multiple-drug-resistant pseudomonas aeruginosa (MDRP)

平成24年7月1日

パナソニック株式会社 殿

帯電微粒子水(ナノイー)による抗菌薬耐性菌を含む 病原微生物の失活化検討

報告書

東邦大学医学部看護学科感染制御学

1/9

小林



What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Bacteria & viruses MRSP (methicillin-resistant staphylococcus pseudintermedius), Bordetella bronchiseptica, Pasteurella multocida

平成 24 年 1 月 27 日

パナソニック株式会社 殿

静電霧化微粒子水(ナノイー)による犬由来病原細菌 $(Staphylococcus\ pseudintermedius,\ Bordetella$ bronchiseptica, Pasteurella multocida) O 不活化効果検証実験

報告書

日本獣医生命科学大学

片岡



1/10

Bacteria & viruses Bacteriophage ΦX174

204032/20_0154_1

パナソニック株式会社 ホームアプライアンス社 殿

試験報告書

ナノイーイオンの浮遊菌、浮遊カビ、浮遊ウイルスに対する 除菌性能評価試験

> 北生発 20_0154_1 号 平成 20 年 10 月 31 日



試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

(PM2.5)



Bacteria & viruses Bacteriophage ΦX174

214055/21_0147

パナソニック電工株式会社 パナソニック株式会社 パナソニック エコシステムズ株式会社 殿

試験報告書

nanoe 発生装置による浮遊ウイルス (大腸菌ファージ) に対する 除去性能評価試験 (10m³循環式)

> 北生発 21_0147 号 平成 21 年 9 月 13 日

神奈川県相模原市北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊祥

試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。 Bacteria & viruses Staphylococcus aureus

204032/20_0154_1

パナソニック株式会社 ホームアプライアンス社 殿

試験報告書

ナノイーイオンの浮遊菌、浮遊カビ、浮遊ウイルスに対する 除菌性能評価試験

> 北生発 20_0154_1 号 平成 20 年 10 月 31 日



試験内容を公表する場合は、事前に当センターの承諾が必要です。また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。 What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

8.



Bacteria & viruses Staphylococcus aureus

214052/21_0142

パナソニック電工株式会社 パナソニック株式会社 パナソニック エコシステムズ株式会社 殿

試験報告書

nanoe 発生装置による浮遊菌(黄色ブドウ球菌)に対する 除菌性能評価試験 (10m³循環式)

> 北生発 21_0142 号 平成 21 年 9 月 14 日

神奈川県相模原市北里1丁目 15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊洋

試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。 Bacteria & viruses Staphylococcus aureus

214010/21_0044

パナソニック電工株式会社 パナソニック株式会社 パナソニック エコシステムズ株式会社 殿

試験報告書

nanoe 発生装置による浮遊菌(黄色ブドウ球菌)に対する 除菌性能評価試験 (10m³循環式)

> 北生発 21_0044 号 平成 21 年 6 月 18 日

神奈川県相模原市北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤 俊洋

試験内容を公表する場合は、事前に当センターの承諾が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。 What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)



Bacteria & viruses Bacteria staphylococcus aureus

244121/24_0301_1

To Panasonic Corporation

Test Report

Evaluation test of the inactivation on airborne bacteria (25 m³ space)

KRCES - Bio. Test Report No.24_0301_1 February 5, 2013

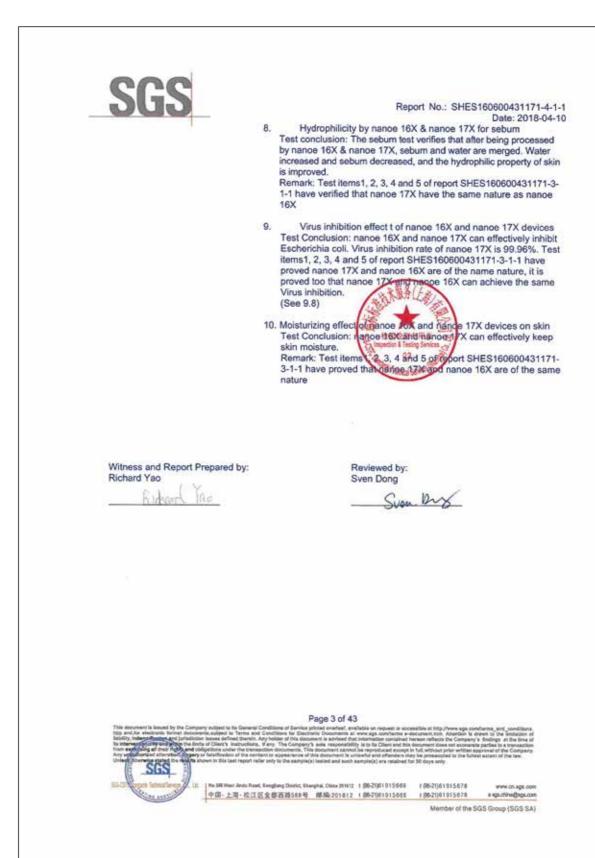
Approved by: Toshehiro Itak

Toshihiro Itoh, Chief Director Kitasato Research Center for Environmental Science

1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

The contents of this report should not be disclosed to the public without prior consent of the Kitasato Research Center for Environmental Science. The test results shown here are applied to only test samples and do not guarantee quality of the whole batch (lot) of the test material.

Bacteria & viruses Bacteria staphylococcus aureus



What is nanoe™ Technology ?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Allergens

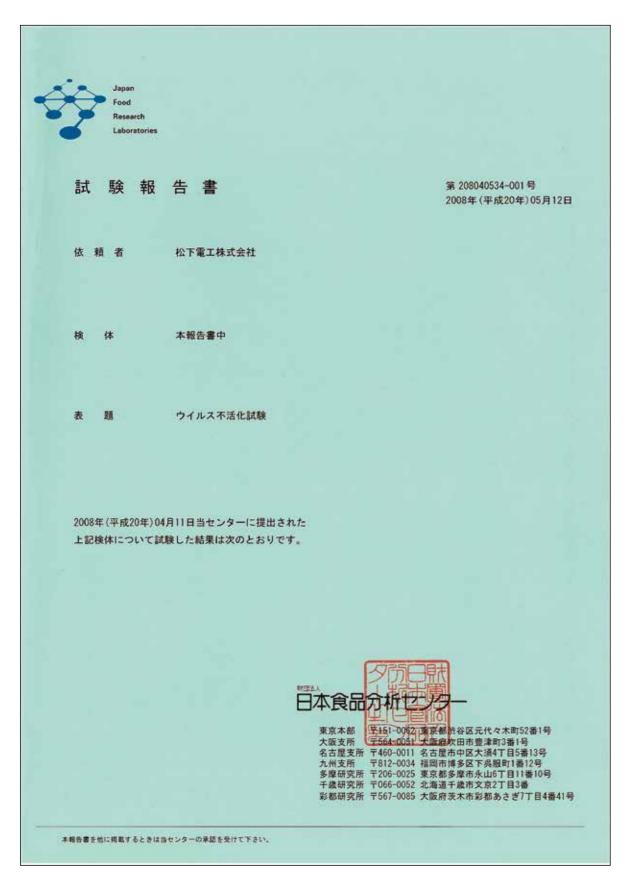
Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

C•nanoe[™]

Bacteria & viruses Influenza virus (H1N1 subtype)



What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of nanoe™ Effects of nanoe-G Compilation of supporting evidence Odours Bacteria & viruses Mould Allergens Pollen

Skin & hair

Hazardous substances (PM2.5)

Dust (PM2.5)

C•nanoe[™]X

Mould Alternaria



Report No.: SHES160600431171-4-1-1 Date: 2018-04-10

- 4. Mold inactivation effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved nanoe 17X and nanoe 16X are of the name nature, it is proved too that nanoe 16X can produce remarkable inactivation effect on mold. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1 (8-hour attenuation), The inactivation time by nanoe X (16X &17X) is 2 times earlier than that by nanoe.
- Effect of nanoe 16X and nanoe 17X upon on hair settlement
 Test conclusion: nanoe 17X and nanoe 16X treated hair is more
 smooth and hangs down more easily.
 Remark: Test items1, 2, 3, 4 and 5 of report SHES160600431171-31-1 have proved that nanoe 17X and nanoe 16X are of the same
 nature
- 6. Effects of nanoe 16X & nanoe 17X in decomposing Hexadecane and benzoic acid Test conclusion: nanoe 16X & nanoe 17X can decompose Hexadecane and benzoic acid Test Consideration: hexadecane is a component of diesel fuel. And It is said that benzoic acid causes acid rain. Hexadecane and benzoic acid are known as an ingredient of PM2.5. nanoe can decompose Hexadecane and benzoic acid. Therefore, nanoe is considered to have a Technological possibility which will improve air environments.

 Test conclusion: The decomposing time for achieving 99.9% of Hexadecane is 16 hours, and of Benzoic acid is 8 hours.Compared
- X (16X &17X) is earlier than that by nance.
 Effects of nance 16X & nance 17X in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA)
 Test conclusion: nance 17X and nance 16X can resolve BaA, BbF, BaP, IcP, and IcP, an

with the data of nanoe in report number SHES160600431171-1-2-1 (over 24 hours and over 8 hour), The decomposing time by nanoe

Test Consideration: Five types of substances with high risk of carcinogen are selected from substances regulated by EPA, the Ministry of the Environment and IARC.

[BaA, BbF, BaP, IcP, and DhA]
And BaA, BbF, BaP, IcP, and DhA

And BaA, BbF, BaP, IcP, and DhA are known as an ingredient of PM2.5. nanoe can decompose BaA, BbF, BaP, IcP, and DhA. Therefore, nanoe may be able to reduce carcinogenic danger. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1, The effects of nanoe X (16X &17X) in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) is beter than that of nanoe.

Page 2 of 43

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世 No.588 West Jindu Pood, Songlang Diselet, Shanghal, China 201612 1 (86-21)61915666 (86-21)61915678 中国-上海-松江区全都西路588号 邮架-201612 1 (86-21)61915666 (86-21)61915678

www.cn.ege.com egs.china@egs.com

Member of the SGS Group (SGS SA)

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nance-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair



Mould Cladosporium

平成17年10月3日

Japan Food Research Laboratories

試験報告書

第 205061541-001号 2005年(平成17年)07月06日

依 頼 者

松下エコシステムズ株式会社

検 体

本報告書中

表 題

カビの消長

2005年(平成17年)06月16日当センターに提出された上記検体について試験した結果は次のとおりです。

日本食品分析センター

東京本部 〒151-0062 東京都渋谷区元代々木町52番1号 大阪支所 〒564-0051 大阪府吹田市豊津町3番1号 名古屋支所 〒460-0011 名古屋市中区大須4丁目5番13号 九州支所 〒812-0034 福岡市博多区下呉服町1番12号 多摩研究所 〒206-0025 東京都多摩市永山6丁目11番10号 千歳研究所 〒066-0052 北海道千歳市文京2丁目3番

本報告書を他に掲載するときは当センターの承認を受けて下さい。

Mould Alternaria



Japan Food Research Laboratories

Accredited by the Japanese Government 52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo 151-0062, Japan http://www.jfrl.or.jp/

> No. 18077411001-0201 Page 1 of 4

Date issued: August 13, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): July 20, 2018

This report has been translated into English from Japanese report No. 18077411001-0101 (Date issued: August 13, 2018).

Signed for and on behalf of JFRL



7. arai

Section of Analysis Documentation

Aug. 30, 2018

Date

日本食品分析センター

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria

& viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

- -





Mould Aspergillus



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No. 17145307001-0801

Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

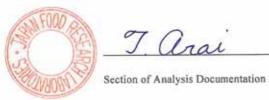
Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0101 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

日本食品分析センター

Mould Cladosporium



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No. 17145307001-0901 Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0201 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



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July 26, 2018

日本食品分析センター

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould



Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair





Mould Eurotium



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http://www.jftl.or.jp/

No. 17145307001-1001

Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0301 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

日本食品分析センター

Mould Fusarium



Japan Food Research Laboratories

No. 17145307001-1101 Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0401 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

Section of Analysis Documentation

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

Dust (PM2.5)





Mould Mucor



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No. 17145307001-1201 Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0501 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

Section of Analysis Documentation

日本食品分析センター

Mould Penicillium



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No. 17145307001-1301 Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0601 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

一巻を記入日本食品分析センター

What is nanoe™ Technology? What are

nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

Dust (PM2.5)

Skin & hair





Mould Stachybotrys



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No. 17145307001-1401

Page 1 of 4

Date issued: January 30, 2018

REPORT

Client: Panasonic Corporation

1048 kadoma, kadoma City, Osaka, 571-8686, Japan

Sample(s): nanoe device

Title: Fungus Growth Test

Received date of sample(s): January 10, 2018

This report has been translated into English from Japanese report No. 17145307001-0701 (Date issued: January 30, 2018).

Signed for and on behalf of JFRL



July 26, 2018

Section of Analysis Documentation

日本食品分析センター

Mould Aspergillus



第 11038081001-02 号 2011年(平成23年)07月01日

依 頼 者 パナソニック電工株式会社



本報告書中

除菌効果試験

2011年(平成23年)04月28日当センターに提出された上記検体について試験した結果をご報告いたします。

本報告書を他に掲載するときは当センターの掲載規約をお守りください。

日本食品分析センター

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)



Mould Penicillium



第 11028760001-01 号 2011年(平成23年)05月16日

試 験 報 告 書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)04月01日当センターに提出された上記検体について試験した結果をご報告いたします。

本部告書を他に掲載するときは当センターの掲載期的をお守りください。

日本食品分析センター

Mould Fusarium



第 11018692001-02 号 2011年(平成23年)04月05日

試 験 報告書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)03月03日当センターに提出された上記検体について試験した結果をご報告いたします。

本報告書を他に掲載するときは音センターの掲載規約をお守りください。

日本食品分析センター

What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

> > Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

J

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Mould Eurotium

224185/22_0455

パナソニック電工 株式会社 殿

試験報告書

試験品による付着カワキコウジカビ (Eurotium tonophilum) に対する抑制性能評価試験 (45 L 循環式)

> 北生発 22_0455 号 平成 23 年 6 月 1 日

神奈川県相模原市南区北里1丁目15番1号 財団法人 北里環境科学センター 理事長 伊藤俊洋

試験内容を公表する場合は、事前に書面による当センターの確認が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。

Mould Mucor



第 11038080001-01 号 2011年(平成23年)06月03日

試験報告書

依 頼 者 パナソニック電工株式会社



検 体 本報告書中

表 題 除菌効果試験

2011年(平成23年)04月28日当センターに提出された上記検体について試験した結果をご報告いたします。

本担告書を他に掲載するときは当センターの掲載規約をお守りください。

日本食品分析センター

What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

8.



Mould Stachybotrys

224185/22_0455

パナソニック電工 株式会社 殿

試験報告書

試験品による付着カワキコウジカビ (Eurotium tonophilum) に対する抑制性能評価試験 (45 L 循環式)

> 北生発 22_0455 号 平成23年6月1日

神奈川県相模原市南区北里1丁目15番1号 財団法人 北里環境科学センタ 理事長 伊藤俊洋

試験内容を公表する場合は、事前に書面による当センターの確認が必要です。 また、本報告書記載の試験結果は供試品に対するものであり、 荷口(ロット)全体の品質を証明するものではありません。

Mould Alternaria



第 11038082001-01 号 2011年(平成23年)06月10日

依 頼 者 パナソニック電工株式会社



本報告書中

除菌効果試験

本智告書を他に掲載するときは当センターの掲載規約をお守りください。

2011年(平成23年)04月28日当センターに提出された上記検体について試験した結果をご報告いたします。

||本食品分析センター

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair



Mould Trichophyton

松下電工株式会社 ヘルシー・ライフ事業部 商品企画グループ 御中 管理番号 E02-061002IN-01

結果報告書

件名:ガーゼ含浸法によるnanoeの防カビ性評価

2006年 10月 20日

株式会社松下電工解析センター 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

> TEL 06-6908-5913 FAX 06-6906-2202



Mould Cladosporium

パナソニック電工株式会社 電器R&Dセンター 御中 管理番号 E02-110801IN-01

結果報告書

件名:nanoeによるCladosporiumの防カビ試験

目次 1.目的 2.アプローチ 3.結果 4.コメント

2011年 8月 23日

パナソニック電工解析センタ-株式会社 材料評価事業部

〒571-8686 大阪府門真市大字門真1048 TEL 06-6906-1269 FAX 06-6906-2202





What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

(PM2.5)



Mould Candida albicans

平成 24 年 1 月 18 日

パナソニック株式会社 殿

静電霧化微粒子水(ナノイー)によるカンジダの 不活化効果検証実験

報告書

千葉大学真菌医学研究センター

矢口



1/3

Mould Cryptococcus neoformans

パナソニック株式会社 殿

平成 24 年 1 月 18 日

静電霧化微粒子水(ナノイー)によるクリプトコッカスの 不活化効果検証実験

報告書

千葉大学真菌医学研究センター

1/3

矢口



What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria

& viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair



Mould Malassezia furfur

平成 24 年 1 月 18 日

パナソニック株式会社 殿

静電霧化微粒子水(ナノイー)によるマラセチアの 不活化効果検証実験

報告書

千葉大学真菌医学研究センター

矢口



1/3

nanoe

Mould Alternaria



Product name

Applicant Address

Testing place

Report issue date

Test Requirement and result

Testing Report 1. nanoe--nanoe 4S & nanoe 3S

2. nanoe-G--nanoe-G

(Refer to Appendix for details on specific commodity models carried by the device)

Report No.: SHES160600431171-2-1-1

Date: 2018-04-10

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District,

Panasonic Product Analysis Center /KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

- Deodorization effect of nanoe 4S and nanoe 3S Test conclusion: nanoe 3S produces remarkable effect upon odor removal. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have proved that nance 4S and nance 3S are of the same nature, it is proved too that nance 4S can produce remarkable effect on ordor removal.
- 2. Bacteria inactivation effect of nance 4S and nance 3S Test conclusion: Bacteria inactivation rate of nance 3S (staphylococcus aureus) is 99.76%. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have provide that nance 4S and nance 3S are of the same nature, it is proved to that nance 4S and nance3S can achieve the same bacteria inactivation effect.
- 3. Pollen allergen inactivation effect nance 4S and nance 3S Test conclusion: nanoe 3S has a remarkable inactivation of pollen allergen, achieving 87.4% inactivation percentage. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have proved too that nance 4S and nance 3S are of the same nature, it is proved too that nance 4S and nance3S have the same inactivation effect.
- 4. Mold inactivation effect of nanoe 4S and nanoe 3S Test conclusion: nanoe 3S produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have proved nance 4S and nance 3S are of the name nature, it is proved too that nance 4S can produce remarkable inactivation effect on mold.
- 5. Effect of nanoe 4S and nanoe 3S upon on hair settlement Test conclusion: nanoe 4S and nanoe 3S-treated hair is more smooth and hangs down more easily. Test items 1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have proved that nanoe 4S and nanoe 3S are of the same nature

Page 1 of 84

No SEE West Jindu Road, Songlang District, Shanghal, China 201612 1 (86-21)61915-666 f (86-21)61915-678

中国-上海-松江区全都西路588号 邮编-201612 1(8621)61915666 f(8621)61915678

Member of the SGS Group (SGS SA)

What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould



Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair



Allergens Dermatophagoides pteronyssinus

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160615-F01

件名:ナノイーXによるヤケヒョウヒダニアレル物質分解試験

2016年7月1日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

Allergens Dermatophagoides farinae

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-170301-F15

件名:エアコン(ナノイーX)のコナヒョウヒダニアレル物質不活化試験

2017年 3月31日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Allergens Alternaria (sooty moulds), Aspergillus (aspergillus genus), Candida, Malassezia

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160615-F02

件名:ナノイーXによるアルテルナリア、アスペルギルス カンジダ、マラセチア アレル物質分解試験

2016年7月1日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

Allergens Cockroach, Moth

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 4AA33-160615-F03

件名:ナノイーXによるゴキブリ、ガ アレル物質分解試験

2016年7月1日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair



Allergens Dog (dander), Cat (dander)

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: 4AA33-160620-F01

件名:ナノイーXによるイヌ、ネコ アレル物質分解試験

2016年7月6日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

Allergens 21 kinds of allergens



Product name

Applicant Address

Testing place

Report issue date Test Requirement and result **Testing Report**

nanoe X---nanoe 16X & nanoe 17X

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District,

Panasonic Product Analysis Center/KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

1. Deodorization effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces remarkable effect upon odor removal. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nanoe 17X and nanoe 16X are of the same nature. it is proved too that nanoe 16X can produce remarkable effect on ordor

Test conclusion: The difference of Cigarette oddor intensity with blank is 1.5 or more after 12 minutes. Compared with the data of nanoe in report number SHES160600431171-1-2-1 (The difference of Cigarette oddor intensity with blank is 1.5, after 120 minutes), The deodorizing speed of Cigarette Odors of nanoe X (16X &17X) is 10 times that of

- 2. Bacteria inactivation effect of nance 16X and nance 17X Test conclusion: Bacteria inactivation rate of nanoe 17X (staphylococcus aureus) is 99.91%. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have provide that nanoe 17X and nance 16X are of the same nature, it is proved to that nance 17X and nance 16X can achieve the same bacteria inactivation effect. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1 (Bacteria inactivation rate is 99.76%), The inactivation effect of nanoe X (16X &17X) is much more effective than that of nance.
- 3. Allergen inactivation effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces remarkable inactivation effect of Allergen Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nanoe 17X and nanoe 16X are of the same nature, it is proved too that nanoe 17X and nanoe 16X have the same inactivation effect.

Test conclusion: The inactivation of pollen allergen, achieving 99.1% inactivation percentage. Compared with the data of nance in report number SHES160600431171-1-2-1 (The inactivation of pollen allergen, achieving 87.4% inactivation percentage), T The inactivation effect of nanoe X (16X &17X) is much more effective than that of

Page 1 of 43

中間・上海・松江区全都西路588号 邮编:201612 1 (8621)61915666 1 (8621)61915678

Member of the SGS Group (SGS SA)

Report No.: SHES160600431171-4-1-1 Date: 2018-04-10

> What are nanoe™ X and nanoe™ ?

What is nanoe™

Technology?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair



Allergens Dermatophagoides farinae

管理番号 BAA33-130304-F04

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三グループ 第二チーム

結果報告書

件名:ダニアレルゲン不活化試験

2013年3月11日

パナソニック株式会社 解析センター 信頼性サポートグループ 信頼性解析チーム

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-0163 FAX 06-6906-2202



Allergens Mite

松下電工株式会社 電器R&Dセンター メカトロデバイス技術開発G 御 管理番号 E02-080204IN-02

結果報告書

件名:nanoeによる抗ダニ試験②

2008年 2月 27日

株式会社松下電工解析センター 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-1269 FAX 06-6906-2202



Technology ?

What are

What is nanoe™

Effects of nanoe™ X

nanoe™ X and

nanoe™ ?

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair





Allergens Aspergillus (aspergillus genus)

Date: May 2, 2011 Report No.: 11M-RPTMAR076_1

Customer: Panasonic Corporation

Test Report

Institute of Tokyo Environmental Allergy, ITEA, Inc. 2-2-4 Yushima Bunkyo-ku Tokyo 113-0034 Japan Tel +81 3 5840 8983 Fax +81 3 5840 8984

Allergens Dog (dander)

Date: May 2, 2011 Report No.: 11M-RPTAPR047_1

Customer: Panasonic Corporation

Test Report

Institute of Tokyo Environmental Allergy, ITEA, Inc. 2-2-4 Yushima Bunkyo-ku Tokyo 113-0034 Japan Tel +81 3 5840 8983 Fax +81 3 5840 8984

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)





Allergens Cat (dander)

Date: June 1, 2011 Report No.: 11M-RPTAPR051_1

Customer: Panasonic Corporation

Test Report

Institute of Tokyo Environmental Allergy, O'EA, Inc. 2-2-4 Yushima Bunkyo-ku Tokyo 113-0034 Japan Tel +81 3 5840 8983 Fax +81 3 5840 8984

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Pollen Cedar

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-151001-F01

件名:エアコン(送風機)+10倍ナノイーの花粉抑制試験

2015年 10月30日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/sec/







1/2

Pollen Cypress, Orchard grass, Ragweed

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-151028-F01

件名:10倍ナノイーの3種の花粉アレル物質分解試験

2015年11月20日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

.

Hazardous substances

(PM2.5)

(PM2.5)

Skin & hair



Pollen Alnus japonica, Japanese white birch, Artemisia

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160601-F01

件名:ナノイーXによるハンノキ、シラカンバ、ヨモギ 花粉アレル物質分解試験

2016年6月20日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

Pollen Olive, Juniper, Casuarina, Miscanthus

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160601-F02

件名:ナノイーXによるオリーブ、ビャクシン、 モクマオウ、ススキ花粉アレル物質分解試験

2016年6月20日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)



Pollen Timothy grass

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-160701-F01 件名:ナノイーXのオオアワガエリ花粉 アレル物質分解試験

2016年7月15日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

Pollen Humulus japonicus

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:1V332-180301-F01

件名:エアコン(ナノイーX)のカナムグラ花粉アレル物質分解試験

2018年3月8日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Pollen Cedar

Panasonic

パナソニック株式会社 アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:4AA33-151015-F01

件名:10倍ナノイーのスギ花粉アレル物質分解試験

2015年11月20日

パナソニック株式会社 解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

> Dust (PM2.5)

Skin & hair





Pollen Cedar

管理番号 E02-080303IN-03

松下電工株式会社 電器R&Dセンター メカトロデバイス技術開発G 御中

結果報告書

件名:nanoeによる抗花粉試験

2008年 3月 14日

株式会社松下電工解析センター 材料評価事業部

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-1269 FAX 06-6906-2202



Pollen Cypress, Ragweed, Orchard grass

「ナノイーによる植物由来アレルゲンの分解に関する検討」

平成 22 年 8 月 3 1 日

信州大学繊維学部化学・材料系

What is nanoe™ Technology? What are

nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

substances (PM2.5)

Dust (PM2.5)

C•nanoe™

Pollen Cedar

管理番号 BAA33-130304-F01

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三グループ 第二チーム

結果報告書

件名:除菌効果試験

2013年3月11日

パナソニック株式会社 解析センター 信頼性サポートグループ 信頼性解析チーム

〒571-8686 大阪府門真市大字門真1048

TEL 06-6906-0163 FAX 06-6906-2202





Pollen Cypress

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:1V332-171010-F04

件名:ナノイーによる付着ヒノキアレル物質分解試験

2017年11月17日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)



Pollen Orchard grass

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:1V332-171010-F02

件名:ナノイーによる付着カモガヤアレル物質分解試験

2017年11月17日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/sec/







1/2

Pollen Ragweed

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号:1V332-171010-F01

件名:ナノイーによる付着ブタクサアレル物質分解試験

2017年11月17日

バナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

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Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

C•nanoe[™]

Pollen Cedar

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター 開発第三部 第二課

試験報告書

報告書番号: IV332-171010-F03

件名:ナノイーによる付着スギアレル物質分解試験

2017年11月17日

パナソニック株式会社 プロダクト解析センター 信頼性ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6906-0163 FAX:06-6906-3732 http://iweb.mei.co.jp/cont/aec/







1/2

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

Mould

Allergens

Hazardous

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

OKIII & IIQII



Hazardous substances (PM2.5) Paraffin (hexadecane)

Panasonic

パナソニック株式会社 アプライアンス社 ビューティ・リビング事業部 デバイス商品部 機能デバイス技術開発課

分析 · 解析結果報告書

報告書番号:Y17NF089

件名:PM2.5分解評価(X-ヘキサデカン)

2017年 11月 27日

パナソニック株式会社 プロダクト解析センター 材料ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6903-0969 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/







Hazardous substances(PM2.5) Aromatic carboxylic acid (benzoic acid)

Panasonic

アプライアンス社 技術本部 ホームアプライアンス開発センター 開発第三部 第二課

分析•解析結果報告書

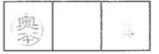
報告書番号:Y17NF096

件名:PM2.5分解評価(X-安息香酸)

2017年 12月 5日

パナソニック株式会社 プロダクト解析センター 材料ソリューション部

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6903-0969 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/



What is nanoe™ Technology?

> What are nanoe™ X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

C•nanoe[™]X

Hazardous substances(PM2.5) Paraffin (hexadecane), Aromatic carboxylic acid (benzoic acid), Benz [a] anthracene (BaA), Benzo [b] fluoranthene (BbF), Benzo [a] pyrene (BaP), Indeno [1,2,3-cd] pyrene (IcP), Dibenzo [a,h] anthracene (Dha)

Report No.: SHES160600431171-4-1-1 Date: 2018-04-10

- 4. Mold inactivation effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved nanoe 17X and nanoe 16X are of the name nature, it is proved too that nanoe 16X can produce remarkable inactivation effect on mold. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1 (8-hour attenuation), The inactivation time by nanoe X (16X &17X) is 2 times earlier than that by nanoe.
- 5. Effect of nance 16X and nance 17X upon on hair settlement Test conclusion: nanoe 17X and nanoe 16X treated hair is more smooth and hangs down more easily. Remark: Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nance 17X and nance 16X are of the same
- Effects of nance 16X & nance 17X in decomposing Hexadecane and benzoic acid Test conclusion: nanoe 16X & nanoe 17X can decompose Hexadecane and benzoic acid Test Consideration: hexadecane is a component of diesel fuel. And It is said that benzoic acid causes acid rain. Hexadecane and benzoic acid are known as an ingredient of PM2.5. nanoe can decompose Hexadecane and benzoic acid. Therefore, nanoe is considered to have a Technological possibility which will improve air Test conclusion: The decomposing time for achieving 99.9% of Hexadecane is 16 hours, and of Benzoic acid is 8 hours. Compared with the data of nanoe in report number SHES160600431171-1-2-1 (over 24 hours and over 8 hour), The decomposing time by nanoe

X (16X &17X) is earlier than that by nance.

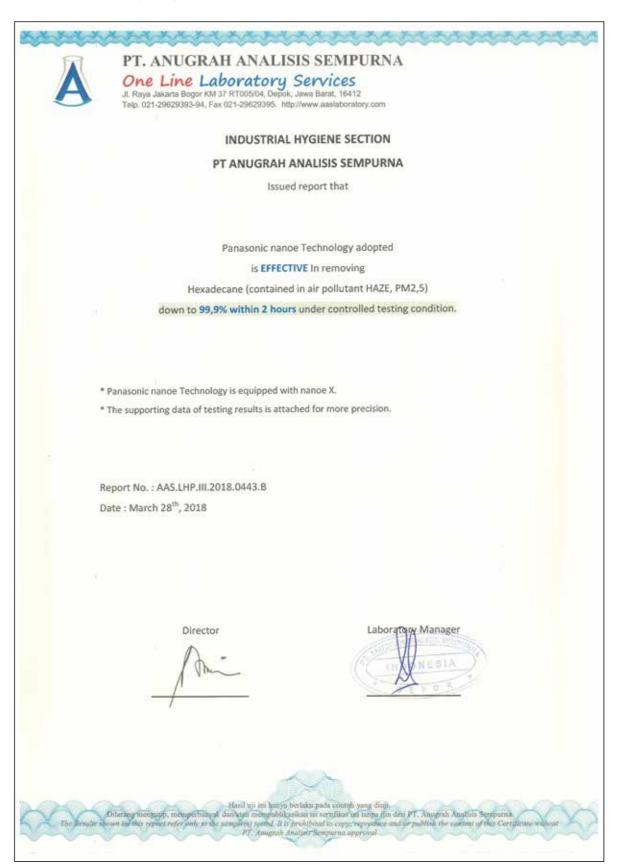
Effects of nanoe 16X & nanoe 17X in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) Test conclusion: nanoe 17X and nanoe 16X can resolve BaA, BbF, Test Consideration: Five types of substances with high risk of carcinogen are selected from substances regulated by EPA, the Ministry of the Environment and IARC. [BaA, BbF, BaP, IcP, and DhA] And BaA, BbF, BaP, IcP, and DhA are known as an ingredient of PM2.5. nanoe can decompose BaA, BbF, BaP, IcP, and DhA. Therefore, nanoe may be able to reduce carcinogenic danger. Test conclusion: Compared with the data of nance in report number SHES160600431171-1-2-1, The effetcs of nanoe X (16X &17X) in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) is beter than that of nance.

Page 2 of 43

E West Jindu Road, Songlang District, Shanghal, China 201612 1 (96-21)61915666 f (96-21)61915678 中国-上海-松江区全都西路588号 邮编:201612 1;8627)61915668 1;8627)61915678

Member of the SGS Group (SGS SA)

Hazardous substances(PM2.5) Hexadecane



What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Allergens

Hazardous substances

(PM2.5)

(PM2.5)

Skin & hair



Hazardous substances(PM2.5) Hexadecane



Institute for Scientific and Technological Research and Services of King Mongkut's University of Technology Thonburi

issued report that

Panasonic nanoe Technology equipped with nanoe is effective in removing hexadecane (contained in air pollutant PM2.5) of 99% within 8 hours under controlled testing condition.

S. Wonguises

Specialist
Department of Mechanical Engineering
Faculty of Engineering

and you

Director
Institute for Scientific and
Technological Research and service

This report is not official unless it carries the raised seal of the university and the genuine authorized signature (s).

This report is valid only for the specimens tested. It does not apply to other pieces of material or products even through made by the same manufacturer.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)





Hazardous substances(PM2.5) Benz [a] anthracene (BaA)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF141

件名:多環芳香族の分解評価(1)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





Hazardous substances(PM2.5) Benzo [b] fluoranthene (BbF)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF142

件名:多環芳香族の分解評価(2)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology? What are nanoe[™] X and

nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances 📦 (PM2.5)

(PM2.5)

Skin & hair





Hazardous substances(PM2.5) Benzo [a] pyrene (BaP)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF143

件名:多環芳香族の分解評価(3)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

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Hazardous substances(PM2.5) Indeno [1,2,3-cd] pyrene (IcP)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF144

件名:多環芳香族の分解評価(4)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology? What are nanoe[™] X and

nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances 📦 (PM2.5)

(PM2.5)

Skin & hair





Hazardous substances(PM2.5) Dibenzo [a,h] anthracene (Dha)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析•解析結果報告書

報告書番号:Y13NF145

件名:多環芳香族の分解評価(5)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of nanoe™ Effects of

Odours

Compilation of supporting evidence

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)



Hazardous substances(PM2.5) Paraffin (hexadecane)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF136

件名:PM2.5の6畳間分解評価(2)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





Hazardous substances(PM2.5) Aromatic carboxylic acid (benzoic acid)

Panasonic

パナソニック株式会社 アプライアンス社 ホームアプライアンス開発センター

分析 · 解析結果報告書

報告書番号:Y13NF135

件名:PM2.5の6畳間分解評価(1)

2014年 1月 8日

パナソニック株式会社 解析センター 分析解析サポートグループ

〒571-8686 大阪府門真市大字門真1048番地 TEL:06-6908-5913 FAX:06-6906-1851 http://iweb.mei.co.jp/cont/aec/





What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

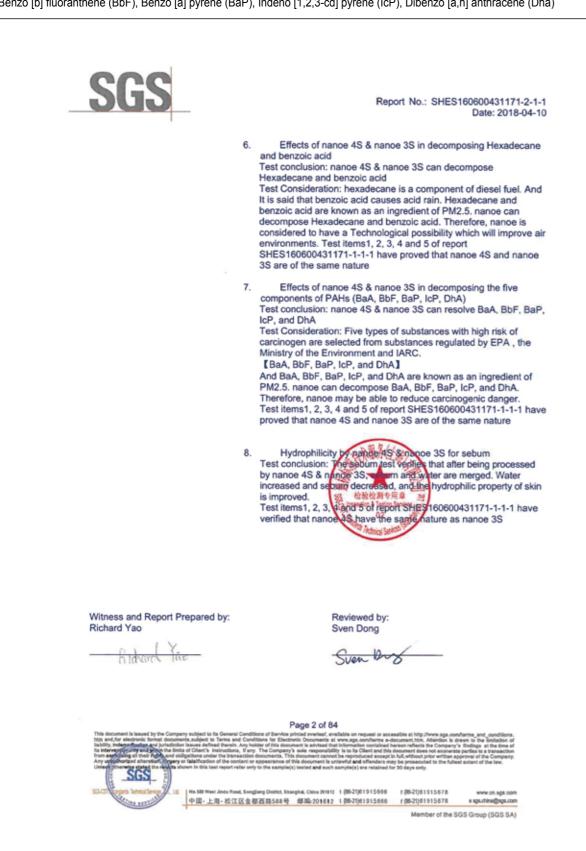
Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair

C•nanoe

Hazardous substances (PM2.5) Paraffin (hexadecane), Aromatic carboxylic acid (benzoic acid), Benz [a] anthracene (BaA), Benzo [b] fluoranthene (BbF), Benzo [a] pyrene (BaP), Indeno [1,2,3-cd] pyrene (IcP), Dibenzo [a,h] anthracene (Dha)



What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of nanoe™ Effects of Compilation of supporting evidence Odours Bacteria & viruses Mould Allergens Hazardous substances | (PM2.5)

220

Skin & hair

Dust

(PM2.5)







Hazardous substances (PM2.5) Benzoic acid

Centre of Innovation (COI-CHP) **School of Applied Science Temasek Polytechnic**

21 Tampines Avenue 1 Singapore 529757

Centre of Innovation (COI-CHP) @ Temasek Polytechnic **Test Report**

Panasonic nanoe Technology, adopted in CS-VU10UKH, is effective in removing benzoic acid (contained in air pollutant particle PM2.5) down to 99 % within 4 hours under controlled testing conditions.

·Panasonic nanoe Technology is equipped with nanoe G and nanoe X

·The supporting data of testing results is attached for more precision

Report No.: TASF_Q\$_61/17/18 : 2nd February 2018

Conducted by:

Principal Investigator

Verified by:

Head/COI-CHP@Temasek Polytechnic

Hazardous substances (PM2.5) Decane, Hexadecane



Pusat Penyelidikan Teknologi Alam Sekitar Environmental Technology Research Centre

Building 15, SIRIM Berhad, Shah Alam, Selangor Darul Ehsan Tel: 60-3-5544 6550 / 6598 Fax: 60-3-5544 6590 / 6579

16 March 2018

AAB Asia Sdn. Bhd. (Registration No.: 1159216-U)

Sir,

Performance Evaluation of Panasonic Air Conditioning with Nanoe X

On behalf of the team and SIRIM Berhad, it has been our pleasure to be given the opportunity to extend our service in conducting the performance evaluation of Panasonic Air Conditioner equipped with Nanoe X functionality in removing chemical contaminants namely n-decane and hexadecane from a fixed item.

The on-site study was performed from the 6 to 8 February 2018 at Panasonic Appliances Air-Conditioning R&D Malaysia Sdn. Bhd. located at Lot 5, Shah Alam Industrial Site, Persiaran Tengku Ampuan, Section 21, 40300 Shah Alam, and Selangor with the following findings:

- n-decane removal was observed to be 99.67% after 2 hours exposure to Panasonic air-conditioner with Nanoe X functionality turn ON; and
- ii. More than 99.94% of hexadecane removal was observed after 8 hours of exposure to Panasonic air-conditioner with Nanoe X functionality turn ON

We look forward to vendor our services and do contact the undersigned for future collaboration.

Thank you.

WWV

Environmental Technology Research Centre

SIRIM Berhad (Company No. 367474-V)

1, Persiaran Dato' Menteri, Section 2, P. O. Box 7035, 40911 Shah Alam, Selangor Darul Ehsan, MALAYSIA Tel: 603-5544 6000 Toll Free: 1 300 88 7035 Fax: 603-5510 8095

Website: www.sirim.my

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Allergens

Hazardous substances (PM2.5)

> Dust (PM2.5)

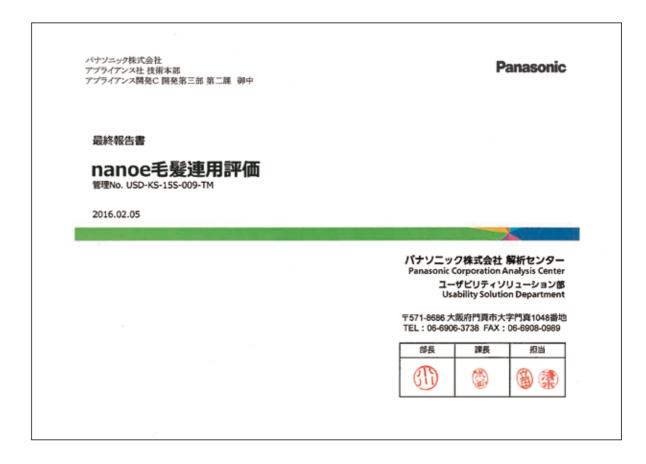
Skin & hair



Skin & hair Skin



Skin & hair Hair



What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

C•nanoe[™]X

Skin & hair Skin

Report No.: SHES160600431171-4-1-1 Date: 2018-04-10 Hydrophilicity by nance 16X & nance 17X for sebum Test conclusion: The sebum test verifies that after being processed by nance 16X & nance 17X, seburn and water are merged. Water increased and sebum decreased, and the hydrophilic property of skin Remark: Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have verified that nance 17X have the same nature as nance Virus inhibition effect t of nance 16X and nance 17X devices Test Conclusion: nanoe 16X and nanoe 17X can effectively inhibit Escherichia coli. Virus inhibition rate of nance 17X is 99.96%. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved nance 17X and nance 16X are of the name nature, it is proved too that nance 17X agoe 16X can achieve the same Virus inhibition. (See 9.8) 10. Moisturizing effect of anoe lox and nance 17X devices on skin Test Conclusion: nance 16X and nance 1 X can effectively keep Remark: Test items 2, 3, 4 and 5 of Goort SHES160600431171-3-1-1 have proved that games 17X and nance 16X are of the same Witness and Report Prepared by: Richard Yao WAS STANGER CHIEF 201617 1 (86-21)61 01 5668 1 (86-21)61 01 5678 中国-上海-松江区全都西路588号 邮编-201812 1 (86-21)61915608 1 (86-21)61915678

Skin & hair Hair



Report No.: SHES160600431171-4-1-1 Date: 2018-04-10

Mold inactivation effect of nanoe 16X and nanoe 17X Test conclusion: nanoe 17X produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved nance 17X and nance 16X are of the name nature, it is proved too that nance 16X can produce remarkable inactivation effect on mold. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1 (8-hour attenuation), The inactivation time by nanoe X (16X &17X) is 2 times earlier than that by nanoe.

5. Effect of nance 16X and nance 17X upon on hair settlement Test conclusion: nanoe 17X and nanoe 16X treated hair is more smooth and hangs down more easily. Remark: Test items1, 2, 3, 4 and 5 of report SHES160600431171-3-1-1 have proved that nance 17X and nance 16X are of the same

Effects of nanoe 16X & nanoe 17X in decomposing Hexadecane and benzoic acid Test conclusion: nanoe 16X & nanoe 17X can decompose Hexadecane and benzoic acid Test Consideration: hexadecane is a component of diesel fuel. And It is said that benzoic acid causes acid rain. Hexadecane and benzoic acid are known as an ingredient of PM2.5. nanoe can

decompose Hexadecane and benzoic acid. Therefore, nanoe is considered to have a Technological possibility which will improve air Test conclusion: The decomposing time for achieving 99.9% of

Hexadecane is 16 hours, and of Benzoic acid is 8 hours. Compared with the data of nanoe in report number SHES160600431171-1-2-1 (over 24 hours and over 8 hour), The decomposing time by nanoe X (16X &17X) is earlier than that by nance.

Effects of nanoe 16X & nanoe 17X in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) Test conclusion: nanoe 17X and nanoe 16X can resolve BaA, BbF, BaP, IcP, and DhA

Test Consideration: Five types of substances with high risk of carcinogen are selected from substances regulated by EPA, the Ministry of the Environment and IARC.

[BaA, BbF, BaP, IcP, and DhA] And BaA, BbF, BaP, IcP, and DhA are known as an ingredient of PM2.5. nanoe can decompose BaA, BbF, BaP, IcP, and DhA. Therefore, nanoe may be able to reduce carcinogenic danger. Test conclusion: Compared with the data of nanoe in report number SHES160600431171-1-2-1, The effetcs of nanoe X (16X &17X) in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) is beter than that of nance.

Page 2 of 43

E West Jindu Road, Songlang District, Shanghal, China 201612 1 (96-21)61915666 r (96-21)61915678 中国-上海-松江区全都西路588号 邮编:201612 1 (8627)61915668 1 (8627)61915678

Member of the SGS Group (SGS SA)

What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair





Skin & hair Skin

研究報告

松下電工株式会社 殿

2008年1月30日 報告書番号 19104

東京都品川区東品川3-32-42 フジテレビ別館6階 株式会社エフシロジー総合研究所 (フジテレビ商品研究所)

平成19年10月15日にご依頼いただきました下記案件について、ご報告いたします。

受託研究名称

nanoe 発生装置による美容効果の研究(1)

◇研究内容

テスト期間:4週間(2007年11月19日~12月18日)

モニター : 健常女性20名(40歳±2歳)

テスト方法:1 詳10名はnanoe発生装置を自宅にて終日連続運転させて4週間使用す

る。残りの 1 群 10 名は n a n o e を発生しない装置を自宅にて終日連続運転

させて4週間使用する。

その前後で肌測定とアンケート調査を行う。

テスト品 : nanoe発生装置

nanoeなし装置



nanoe

Skin & hair Skin

肌潤い効果に対する nanoeデバイス条件の比較評価

パナソニック電工解析センター株式会社 ユーザビリティ事業部 立田

Skin & hair Hair

2009/10/27

2010/1/26

nanoeデバイスによる長期連用評価 ~2週間連用暴露による毛束まとまり効果検証~

> パナソニック電工解析センター ユーザビリティ事業部

What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances

(PM2.5)

Dust (PM2.5)

C•nanoe

Skin & hair Skin

SGS

Report No.: SHES160600431171-2-1-1 Date: 2018-04-10

Effects of nance 4S & nance 3S in decomposing Hexadecane and benzoic acid
Test conclusion: nance 4S & nance 3S can decompose
Hexadecane and benzoic acid
Test Consideration: hexadecane is a component of diesel fuel. And It is said that benzoic acid causes acid rain. Hexadecane and benzoic acid are known as an ingredient of PM2.5. nance can decompose Hexadecane and benzoic acid. Therefore, nance is considered to have a Technological possibility which will improve air environments. Test items1, 2, 3, 4 and 5 of report
SHES160600431171-1-1-1 have proved that nance 4S and nance 3S are of the same nature

7. Effects of nanoe 4S & nanoe 3S in decomposing the five components of PAHs (BaA, BbF, BaP, IcP, DhA) Test conclusion: nanoe 4S & nanoe 3S can resolve BaA, BbF, BaP, IcP, and DhA Test Consideration: Five types of substances with high risk of carcinogen are selected from substances regulated by EPA, the Ministry of the Environment and IARC.

[BaA, BbF, BaP, IcP, and DhA]
And BaA, BbF, BaP, IcP, and DhA are known as an ingredient of PM2.5. nanoe can decompose BaA, BbF, BaP, IcP, and DhA. Therefore, nanoe may be able to reduce carcinogenic danger. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have proved that nanoe 4S and nanoe 3S are of the same nature

8. Hydrophilicity by named 45 & nagoe 3S for sebum
Test conclusion: The sebum test verifies that after being processed
by nanoe 4S & name 3S, the man and water are merged. Water
increased and sebum decreased, and the hydrophilic property of skin
is improved.
Test items1, 2, 3, 4 and 5 of report SHBS 160600431171-1-1-1 have
verified that nanoe 4S have the same nature as nanoe 3S

Witness and Report Prepared by: Richard Yao

Richard The

Reviewed by:

Sven box

Page 2 of 84

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SGS

 e sgruchine@sgrucom

Member of the SGS Group (SGS SA)

Skin & hair Hair



Product name

Applicant Address

Testing place

Report issue date

Test Requirement and result

Testing Report

1. nanoe—nanoe 4S & nanoe 3S

2. nanoe-G--nanoe-G

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District, Shanghai

Panasonic Product Analysis Center /KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

Deodorization effect of nanoe 4S and nanoe 3S
 Test conclusion: nanoe 3S produces remarkable effect upon odor
 removal. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1
 have proved that nanoe 4S and nanoe 3S are of the same nature, it is
 proved too that nanoe 4S can produce remarkable effect on ordor
 removal.

Bacteria inactivation effect of nanoe 4S and nanoe 3S
Test conclusion: Bacteria inactivation rate of nanoe 3S
(staphylococcus aureus) is 99.76%. Test items1, 2, 3, 4 and 5 of
report SHES160600431171-1-1-1 have provide that nanoe 4S and
nanoe 3S are of the same nature, it is proved to that nanoe 4S and
nanoe3S can achieve the same bacteria inactivation effect.

3. Pollen allergen inactivation effect nanoe 4S and nanoe 3S Test conclusion: nanoe 3S has a remarkable inactivation of pollen allergen, achieving 87.4% inactivation percentage. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1 have proved too that nanoe 4S and nanoe 3S are of the same nature, it is proved too that nanoe 4S and nanoe3S have the same inactivation effect.

4. Mold inactivation effect of nanoe 4S and nanoe 3S Test conclusion: nanoe 3S produces a remarkable inactivation effect on mold. Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1 have proved nanoe 4S and nanoe 3S are of the name nature, it is proved too that nanoe 4S can produce remarkable inactivation effect on mold.

Effect of nanoe 4S and nanoe 3S upon on hair settlement
Test conclusion: nanoe 4S and nanoe 3S-treated hair is more
smooth and hangs down more easily.
 Test items1, 2, 3, 4 and 5 of report SHES160600431171-1-1-1 have
proved that nanoe 4S and nanoe 3S are of the same nature

age 1 of 84

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Date: 2018-04-10

Report No.: SHES160600431171-2-1-1

What are nanoe™ X and nanoe™ ?

What is nanoe™

Technology?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

, anongonio

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

Skin & hair

C∙nanoe-g

Odours Cigarette smoke odour

帳票番号: OAS BK-007 版番号: 04

測定結果報告書

報告書番号第13-1204号

パナソニック株式会社 アプライアンス社 エアコン事業部 殿

近江オドエア サービス株式会社本 社 滋賀県近江八幡市魚屋町元30番地事業所 滋賀県近江八幡市出町653番地公益社団法人 におい・かおり環境協会第 一種 臭 気 測 定 認 定 事 業 所第112(04)号 臭気判定士 竹井

貴依頼による臭気に係る測定の結果を次の通り報告します。

測 定 項 目 : 臭気強度

測 定 方 法 : 6段階臭気強度表示法

試 料: パナソニック(株) アプライアンス社エアコン事業部様持ち込み試料

カーテン片 200mm × 200mm

<試料作製条件> 試験空間: 20m3

対象臭気:タバコ臭

試 験 品: ナノイーG搭載エアコン 試験場所: 近江オドエアーサービス(株)

判定試験日: 2013年12月10日

測定の結果

試料名	臭気強度 (パネル6名)
カーテン片のみ	0.92
O分(初期)	4.17
自然放置30分	3.75
試験品運転あり30分	3.08
自然放置60分	3.50
試験品運転あり60分	2.75
自然放置120分	3.25
試験品運転あり120分	2.25

以上

Bacteria & viruses Staphylococcus aureus NBRC 12732

234067/23_0182

Panasonic CO.,LTD.

Test Report

Evaluation test of nanoe-G on airborne micro organisms using S.aureus (25m³)

KRCES-Bio. Test Report No. 23_0182 September 20, 2011

Approved by: Tashilivo Stok

Toshihiro Itoh, Chief Director

Kitasato Research Center for Environmental Science
1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

The contents of this report should not be disclosed to the public without prior consent of the Kitasato

Research Center for Environmental Science. The test results shown here are applied to only test

samples and do not guarantee quality of the whole batch (lot) of the test material.

What is nanoe™ Technology?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of nanoe-G

Compilation of supporting evidence

reports

Odours

Bacteria & viruses

lould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

n O bair



Bacteria & viruses Staphylococcus aureus subsp. Aureus NBRC 12732



Bacteria & viruses Escherichia coli phage [ΦX-174 ATCC 13706-B1], Influenza [H1N1] 2009 virus

227008/22_0008 Panasonic CO.,LTD. Test Report Evaluation test of the nanoe-G on airborne micro-organisms using Viruses KRCES-Env. Test Report NO. 22_0008 February 14, 2011 Approved by: Toshihiro Itot Toshihiro Itoh, Chief Director Kitasato Research Center for Environmental Science 1-15-1, Kitasato, Minami-ku, Sagamihara-shi, Kanagawa 252-0329, Japan The contents of this report should not be disclosed to the public without prior consent of the Kitasato Research Center for Environmental Science. The test results shown here are applied to only test samples and do not guarantee quality of the whole batch (lot) of the test material.

What is nanoe™
Technology?

What are
nanoe™ X and
nanoe™?

Effects of
nanoe™ X

Effects of
nanoe™

evidence

Test
reports

Compilation of supporting

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

> Dust (PM2.5)

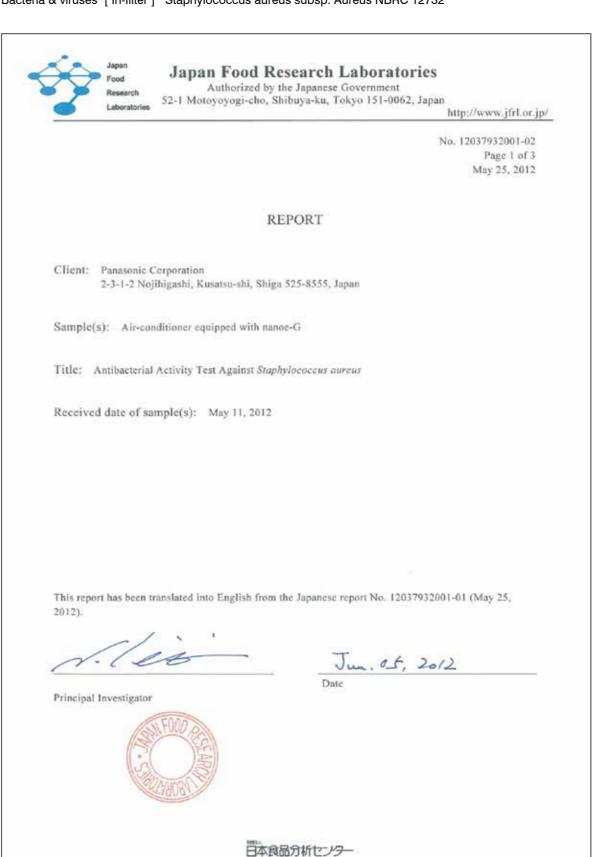
Skin & hair

C•nanoe-g

Bacteria & viruses Bacteriophage [ΦX-174 NBRC 103405]



Bacteria & viruses [In-filter] Staphylococcus aureus subsp. Aureus NBRC 12732



What is nanoe™
Technology?

What are
nanoe™ X and
nanoe™?

Effects of
nanoe™ X

Effects of
nanoe™

Compilation
of supporting
evidence

Test
reports

Bacteria & viruses

Odours

lould

Allergens

Dellas

Hazardous

substances (PM2.5)

(PM2.5)

C•nanoe-G

Bacteria & viruses [In-filter] Bacteriophage [ΦX-174 NBRC 103405]



Japan Food Research Laboratories

Authorized by the Japanese Government 52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo 151-0062, Japan

http://www.jfrl.or.jp/

No. 12014705001-02 Page 1 of 4 March 15, 2012

REPORT

Client: Panasonic Corporation

2-3-1-2 Nojihigashi, Kusatsu-shi, Shiga 525-8555, Japan

Sample(s): Air-conditioner equipped with nanoe-G

Title: Bacteriophage Inactivation Test

Received date of sample(s): February 24, 2012

This report has been translated into English from the Japanese report No. 12014705001-01 (March 15,

1. 100 Jun. 05, 2012

Principal Investigator



日本食品分析センター

Bacteria & viruses [In-filter] Influenza [H1N1] 2009 virus

247013/24_1013

KRCES- Virus Test Report No.24 1013 Aug 9, 2012

Panasonic Corporation

Test Report

Evaluation test for virus inactivation effect of air-conditioner equipped with "nanoe-G" against Influenza A virus (H1N1)

> KRCES-Virus Test Report No. 24_1013 Aug 9, 2012

Approved by: Toshihiro Itak

Toshihiro Itoh, Chief Director Kitasato Research Center for Environmental Science 1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

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What is nanoe™ Technology?

What are nanoe[™] X and nanoe™ ?

nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous (PM2.5)

Dust (PM2.5)

Skin & hair



Mould Penicillium pinophilum NBRC 6345

234050/23_0140

Panasonic CO.,LTD.

Test Report

Evaluation test of nanoe-G on airborne micro-organisms using *Penicillium pinophilum*(25m³)

KRCES-Bio. Test Report No. 23_0140 September 20, 2011

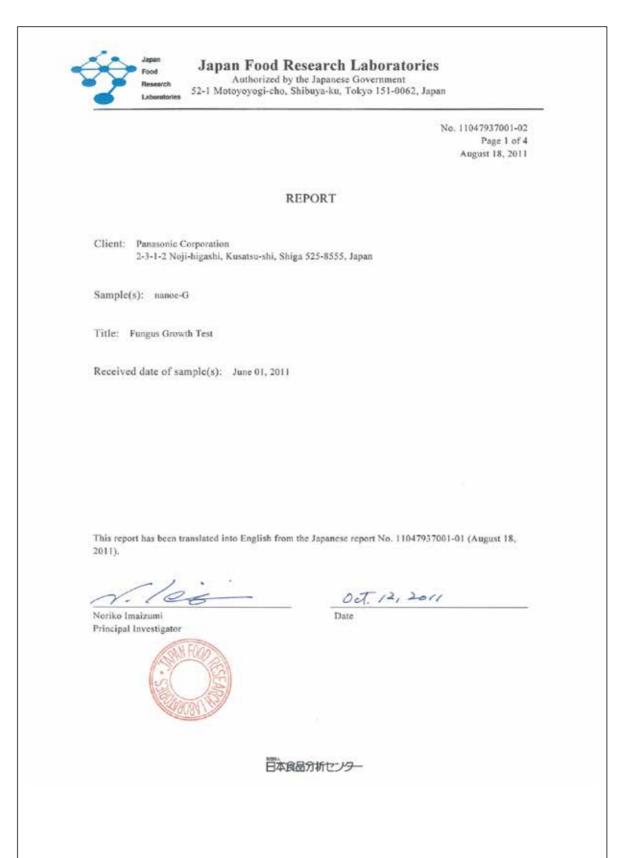
Approved by: Toshihiro Stok

Toshihiro Itoh, Chief Director

Kitasato Research Center for Environmental Science
1-15-1, Kitasato, Minami, Sagamihara, Kanagawa 252-0329, Japan

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Mould Cladosporium cladosporioides NBRC 6348



What is nanoe™ Technology ?

What are nanoe™ X and nanoe™ ?

Effects of nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

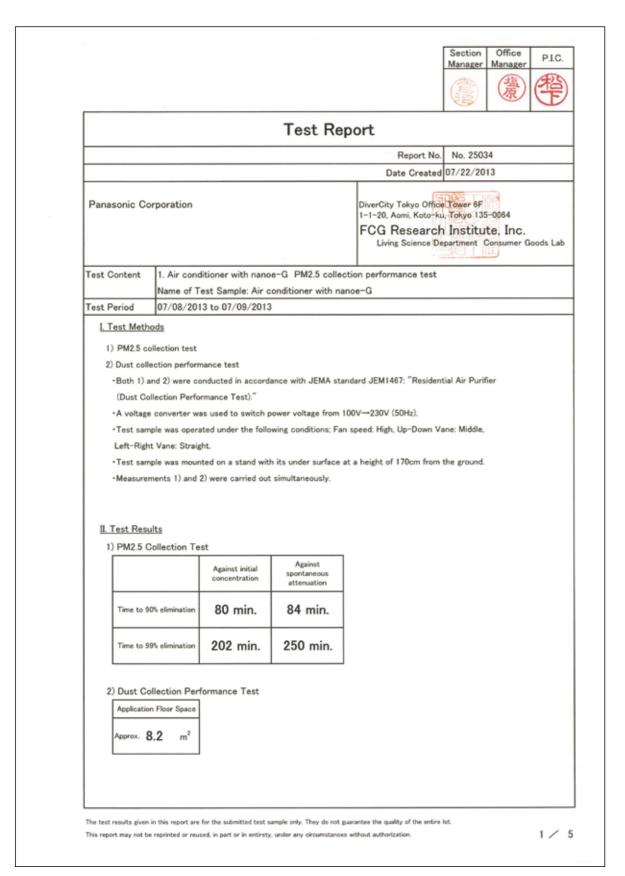
Dellan

Hazardous substances (PM2.5)

> Dust (PM2.5)

C•nanoe-g

Dust (PM2.5) Cigarette Smoke [as PM2.5]



What is nanoe™ Technology? What are nanoe™ X and nanoe™ ? nanoe™ X Effects of nanoe™ Effects of Compilation of supporting evidence Odours Bacteria & viruses Mould Allergens Hazardous substances (PM2.5)

242

Skin & hair

Dust

(PM2.5)



Verification of major characteristics of nanoe[™]X

1) Amount of OH radicals 2) pH value 3) Size 4) Moisture content

Product name

Applicant Address

Testing place

Report issue date

Test requirement and result

Report No.: SHES160600431171-3-1-1 Date: 2018-04-10

Testing Report

nanoe X---nanoe 16X & nanoe 17X

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District,

Panasonic Product Analysis Center/KANAZAWA University NM Research Laboratory

Test items requested by the customer

- 1. Measurement of Hydroxyl radical (OH radical amount in the particles occurred in nanoe 16X and nanoe 17X) Test conclusion: Average OH occurrence speed of nanoe 16X is 651.4×1010 spin/s. Average OH occurrence speed of nanoe 17X is $656.9\!\times\!10^{10}$ spin /s. Compared with the data of nance 4S in report number SHES160600431171-1-2-1 (65.4 x 1010 /s), the average OH speed of nanoe 16X and nanoe 17X is ten times of nanoe 4S.
- Measurement of PH value of the particles occurred in nanoe 16X and nanoe 17X
 - Test conclusion: Average PH value of nanoe 16X is 5.37, and average PH value of occurrence particles of nanoe 17X is 5.29, both in the range of 5.0±0.5, subacidity.
- 3. Diameter of particles occurred in nanoe 16X, nanoe 17X Test conclusion: to prove that the diameter of occurrence particles of nanoe 16X and nanoe 17X is in the range of 5nm-

As earlier test items 3 have proved that the diameter of nance 16X and nanoe 17X is in the range of 5nm-20nm, and test items 3 of report SHES160600431171-1-1-1 have proved that the diameter of negative ion is in the range of 0.5nm-2nm, it is proved too that the moisture of nanoe is 1,000 times more water content than the general negative ion

4. Existence of water ion (water content) in the particles occurred in nance 16X and nance 17X

Test conclusion: to prove that occurrence particles of nanoe 16X and nance 17X devices contain plenty of water content.

Page 1 of 24

SM West Andy Road, Songlang District, Shanghal, China 201612 1 (86-2/161915-668 / 66-2/161915-678 中国-上海-松江区全都西路588号 邮编-201612 1,86-21)61915888 1,68-21)61915878

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5) Lifespan



Report No.: SHES160600431171-3-1-1

Stability of the particles occurred in nanoe 16X and nanoe 17X Test conclusion: After 1m, 5m and 10m, survival rates of occurrence particles of nance 16X and nance 17X are 65.78, 27.68, 15.46 and 69.31, 31.49, 18.07, respectively. After 1m, 5m and 10m, survival rates of the negative for an another than 5m and 10m, survival rates of the negative for an 108, 0.23 and 0.09, respectively. That shows that the survival rates (morely stability) of occurrence particles of nance 48X and nance 43X are over 60 times that of the negative ion, and the coverage distances reaches over 10m. Thus, the assertion that nance has about 5 times survival rates than the general negative ion is proved.

Report Prepared by: Richard Yao

Reviewed by: Sven Dong

Page 2 of 24

West Ands Reed, Songlang District, Shanghal, China 391612 1 (96-21)61915658 1 (96-21)61915678 中國-上灣-松江区全學西路588号 鄉路-201612 1 206-2061915868

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What is nanoe™ Technology?

> What are nanoe[™] X and nanoe™?

nanoe™ X

Effects of nanoe™

Effects of

Compilation of supporting evidence

Odours

Bacteria & viruses

Mould

Allergens

Hazardous substances (PM2.5)

(PM2.5)

Skin & hair

C•nanoe

Verification of major characteristics of nanoe[™]

1) Amount of OH radicals 2) pH value 3) Size 4) Moisture content



Product name

Applicant Address

Testing place

Report issue date

Test requirement and result

Report No.: SHES160600431171-1-1-1 Date: 2018-04-10

Testing Report

1. nanoe—nanoe 4S & nanoe 3S

nanoe-G—nanoe-G

(Refer to Appendix for details on specific commodity models carried by the device)

Panasonic Corporation of China Co., Ltd. Shanghai Branch

7th Floor, Hongkou SOHO, No.575 Wusong Road, Hongkou District, Shanghai

Panasonic Product Analysis Center/KANAZAWA University NM Research Laboratory

2018-04-10

Test items requested by the customer

- Measurement of Hydroxyl radical (OH radical amount in the particles occurred in nanoe 4S and nanoe 3S)
 Test conclusion: Average OH occurrence speed of nanoe 4S is 65.4×10¹⁰ spin/s. Average OH occurrence speed of nanoe 3S is 60.8×10¹⁰ spin/s.
- Measurement of PH value of the particles occurred in nanoe 4S and nanoe 3S Test conclusion: Average PH value of nanoe 4S is 5.34, and average PH value of occurrence particles of nanoe 3S is 5.23,
- both in the range of 5.0±0.5, subacidity.

 3. Diameter of particles occurred in nance 4S, nance 3S and nance-G
 - Test conclusion: to prove that the diameter of occurrence particles of nanoe 4S and nanoe 3S is in the range of 5nm-20nm, and that of nanoe-G (negative ion) is in the scope of 0.5nm-2nm.
- and that of nanoe-G (negative ion) is in the scope of 0.5nm-2nm.
 Existence of water ion (water content) in the particles occurred in nanoe 4S and nanoe 3S

Test conclusion: to prove that occurrence particles of nance 4S and nance 3S devices contain plenty of water content.

As earlier test items 3 have proved that the diameter of nance 4S and nance 3S is in the range of 5nm-20nm, and that of negative ion is in the range of 0.5nm-2nm, it is proved too that the moisture of nance is 1,000 times more water content than the general negative ion.

Page 1 of 51

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5) Lifespan



Report No.: SHES160600431171-1-1-1 Date: 2018-04-10

5. Stability of the particles occurred in nanoe 4S and nanoe 3S
Test conclusion: After 1m, 5m and 10m, survival rates of occurrence
particles of nanoe 4S and nanoe 3S are 39.8, 22.3, 15.2 and 66.7,
30.3, 16.4, respectively. After 1m, 5m and 10m, survival rates of the
negative ion are 1.07, 0.23 and 0.09, espectively. That shows that
the survival rates (namely stability) of occurrence particles of nanoe
4S and nanoe 3S are over 35 times that on the negative ion, and the
coverage distances reaches on 10m. Thus, the assertion that
nanoe has about 6 tries survival vates than the general negative ion
is proved.

Report Prepared by: Richard Yao

Fidure Tar

Reviewed by: Sven Dong

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Page 2 of 51

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What is nanoe™ Technology?

What are nanoe™ X and nanoe™?

Effects of nanoe™ X

Effects of nanoe™

Effects of nance-G

Compilation of supporting evidence

Test reports

Odours

Bacteria & viruses

Mould

Allergens

Pollen

Hazardous substances (PM2.5)

Dust (PM2.5)

Skin & hair