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# TEST REPORT

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(Pathogenic Bacteria)  
SeJungA Kindergarden



KSD Co., Ltd.  
SUNG DAE Env'l Science R&D

Certificate Authority





# FINAL REPORT

## KSD0223

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PERFORMANCE TESTING FOR 'Wellis'

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KSD Co., Ltd.  
SUNG DAE Env'l Science R&D



## TSET OUTLINE

TEST TITLE : 'Wellis' air germ purifier Pathogen-reducing efficacy test

TEST NO. : ksd0223190910

TEST ITEM: Performance test for pathogenic bacteria reduction test

TEST PURPOSE : This experiment was conducted to evaluate the efficacy of bactericidal OH function and to compare the pre- and post-sterilization status with respect to the ability to purify pathogenic bacteria.

TSET METHODS : This test was conducted according to the test standard of indoor air quality process on Dec. 21, 2018 of the Ministry of Environment according to Article 6, Paragraph 1, Article 3 of the 「Act on Environmental Testing and Inspection」 .

Test Requester :

NAME: RE-CO PLANT Co., Ltd.

Location: 174-10, Chilgari-ro, Eumam-myeon, Seosan-si, Chungnam, Korea

CEO: Hyun Ho, JI

CONTACT: 041-665-9153

[www.rcp.co.kr](http://www.rcp.co.kr)

Testing Institution:

NAME : KSD Co., Ltd. SUNG DAE Env'l Science R&D (Certificate Authority)

Location : 86 Hakhyeon-ro, Uiwang-si, Gyeonggi-do

CEO : Hyun Jo, LEE

CONTACT: Tel)1577-4446 Fax)031-624-4968

[www.ksdpf.com](http://www.ksdpf.com)

TEST SCHEDULE:

Primary measure, Before installation : 2019.09.10-13:30 ~15:30

Secondary measure, After installation : 2019.09.16-09:10 ~10:30

TEST DATE : 2019.09.10-09.16

TEST END DATE : 2019.09.18

## Test Method

1) measurement location : SeJungA Kindergarden (Class name : HanNuRi 5)

2) Inspection Date : Sept. 10. 2019 / 13:30 – Before construction 2 minutes interval 3 measurements (PB)  
Sept. 16. 2019 / 09:10 – After construction 2 minutes interval 3 measurements (PB)

3) Inspection Item : Pathogenic Bacteria

4) Inspection & Analysis Method : Pathogenic bacteria were measured according to the "Indoor Air Quality Process Test Method". WeLLis bactericidal performance test was followed by the average of 20 minutes interval 3 measurements.

**(1) Pathogenic Bacteria:**

Take 1 mL of each test solution and 1 mL of 10–fold dilution solution in aseptical petridish and dispense 15 mL of standard agar medium maintained about 35 °C to 45 °C. Be careful not to turn the petridish quietly. And carefully inclining right and left to mix and solidify the specimen and agar medium.  
In order to suppress the occurrence of diffusion bacterial colony, 3–5 mL of standard agar medium is re-added and overlapped.  
In this case, the time from taking a specimen to adding the medium should not exceed 20 minutes.

The coagulated petridish is inverted and incubated at 35 ~ 37 °C for 24 ~ 48 hours (72 ± 3 hours depending on the sample). 1mL of the same dilution that is not adding test liquid is used as a control test solution to check whether asepsis or not.

**(2) Pathogenic Bacteria:**

It is a method of collecting pathogenic bacteria in indoor air and measuring the concentration by using the principle that microorganisms in the air collide with the medium that Use a harvesting machine equipped with a bacterial medium.

**(3) Cultured Pathogenic Bacteria**

staphylococcus aureus  
Streptococcus pneumoniae  
Escherichia Coli

**(4) Cultured Mole**

Aspergillus

## Result

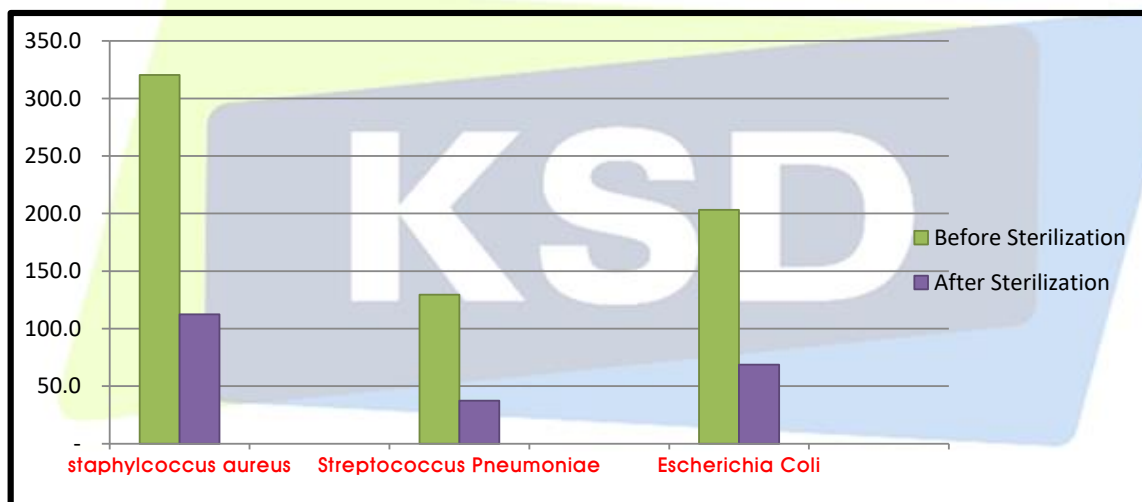
1) Pathogenic bacteria: TAB Legal Baseline 800(CFU/m<sup>3</sup>), Bacterium has none.

※ The mean value is for three tests.

Pathogenic Bacteria(CFU/m<sup>3</sup>)

classification	staphylococcus aureus	Streptococcus Pneumoniae	Escherichia Coli
<b>Legal Baseline</b>			
Before Sterilization	320.3	129.4	203.3
After Sterilization	112.5	37.5	68.8
Removal Efficiency	64.87%	71.02%	66.15%

Table 1.



※ This test is the result before and after wellis is monitored for airborne sterilization.

## Discussion & Conclusion

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The indoor environment problem is a phenomenon caused by indoor pollution, that is, various pollutants generated by human activities are released into the room and pollute the indoor environment.

There is the potential for physical, chemical and biological contaminants among indoor air, which are caused by complex sources such as inflow of outside air, tobacco smoke, heaters, oven cookware, cement, cleaners, building materials and paints. Therefore, the emission is also known to show a significant deviation depending on the pollutant. Indoor air pollution refers to the polluted air of various indoor spaces such as houses, schools, offices, public buildings, hospitals, underground facilities, and transportation. It's not life threatening, but it must be bad for your health in the long term.

Recently, in order to analyze the health effects of indoor air pollution more accurately, the amount of exposure to pollutants according to personal activities is measured during 24 hours a day. Research is also expanding and is a health threat due to bacteria, fungi and fine dust from high temperature and humidity.

In modern society, where the importance of the environment is increasing, the research on indoor air quality is expanding, and in accordance with attention is being paid to the processing method. As a result, it is up to the wise consumer to decide which method they choose.

Wellis air purification has demonstrated the degradation of pollutants due to odor neutralization and strong chemical reactions. In addition, it has a strong bactericidal antimicrobial effect of pathogenic bacteria remaining in air conditioners and indoors.





Photo for before and after sterilization treatment



Photo for before and after sterilization treatment

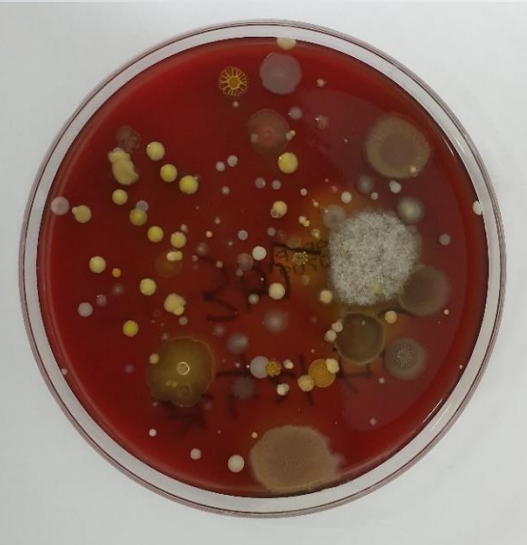
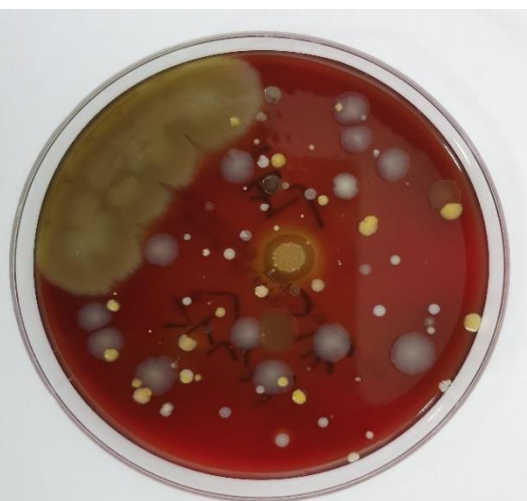


Photo for before and after sterilization treatment

# Wellis' air germ purifier PB–reducing efficacy test

TEST LOCATION	SeJungA Kindergarden	TEST DATE	Sept. 10. 2019 13:30 PM
TEST CONTENTS	HanNuRi 5 : 'Wellis' air germ purifier Before Sterilization		

Take air sample 3 times every 20 minutes.

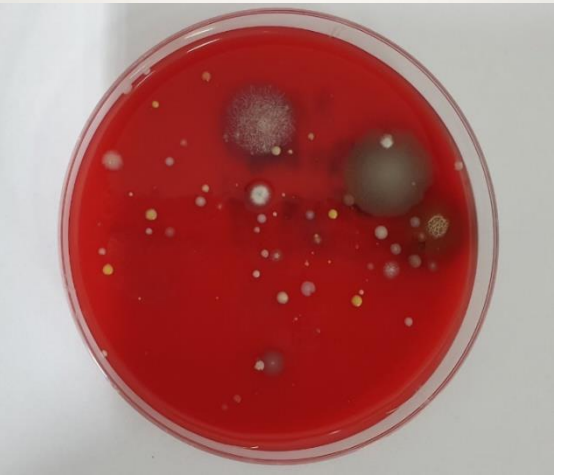




# Wellis' air germ purifier PB–reducing efficacy test

TEST LOCATION	SeJungA Kindergarden	TEST DATE	Sept. 16. 2019 10:00 AM
TEST CONTENTS	HanNuRi 5 : 'Wellis' air germ purifier After Sterilization		

Take air sample 3 times every 20 minutes.





# Indoor Air Quality Process Test Report

Testing Institution Info.	TEST ITEM	Pathogenic Bacteria	TEST PURPOSE	wellis air germ purifier pathogen-reducing efficacy test
	TEST DATE	Sept. 10, 16. 2019	RESEARCHER	Won-Sam Jo, Chung-Hyun Lee
	TEST LOCATION	SeJungA Kindergarden	Reception Date	Sept. 10. 2019
Testing Requester Info.	N A M E	RE-CO PLANT Co., Ltd.	Representative	General Manager JUNG IN HAM
	PRODUCT NAME	Wellis Air Disinfection Unit (WADU-02)		
	LOCATION	174-10, Chilgari-ro, Eumam-myeon, Seosan-si, Chungnam, Korea		

According to Article 6, Paragraph 1, Article 3 of the 「Act on Testing, Inspection, etc. of Environmental Sector」.

Certificate of inspection is issued in accordance with environmental pollution process test standards.

TEST ITEM	Inspection Point	Before Sterilization	After Sterilization	Removal Efficiency%
staphylococcus aureus	1 (3 times)	320.3	29.0	64.9
Streptococcus Pneumoniae	1 (3 times)	129.4	37.5	71.0
Escherichia Coli	1 (3 times)	203.3	68.8	66.2

Judgment: The effect of disinfecting sterile volatilized contaminants demonstrates excellent functionality.

Sept. 20. 2019

**KSD Co., Ltd.**  
**SUNG DAE Env'l Science R&D**



Quality Director : In Hak, YEO

Technology Director : Sung Dea, KIM

Note: This test report is the result of the sample and sample name suggested by the sponsor, so it cannot be used for any other purpose.

This test report shall not be used as a commercial advertising or legal solution.