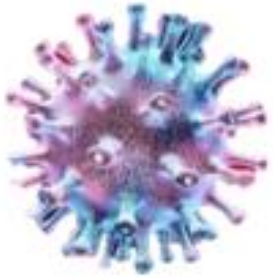


**Corona Virus (Covid-19) Sterilization (surface 99%/2hr,float 68.4%/2hr,  
77.3% 4weeks) and Antibacterial (Fungus, Bacteria 99.9%),  
Deodorant,Flame Retardant coating and paint.**



**NWK A-BMV was registered USA FDA as Disinfectant of Medical  
Device(9.Mar.2021)**



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# 1. Development of a New Product of **the CV-19 Sterilizer**

7

## 1) Product Name: **NWK A-BMV(Bacteria,Mold,Virus)**

### ■ **Technical Summary**

- As a complex compound made up of **Silicate + Modified Polydimethylsiloxane, Edible Natural Oil etc.**, it is a **COVID19 sterilizer** and an **antibacterial (fungus, bacteria)**, **flame-retardant, and mineral coating agent**.
- It has eco-friendly substances with no smells and toxins.
- It is economical as the sterilization lasts for up to five years once coated.

### ■ **Test Result**

- The result of the test done by KTR(Korea Test & Research Institute), a Professional Virus-Testing Institute, confirmed that CV-19 perished by floor 99%(2hrs), float 68.4%(2hrs), 77.4%(4weeks)
- **NWK A-BMV was registered USA FDA as Disinfectant of Medical Device(9.Mar.2021)**
  - **Registration Number:301091833**
  - **<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfRL/rl.cfm>**

### ■ **Securing Source Technology as to the Coating agent and Expected Effect**

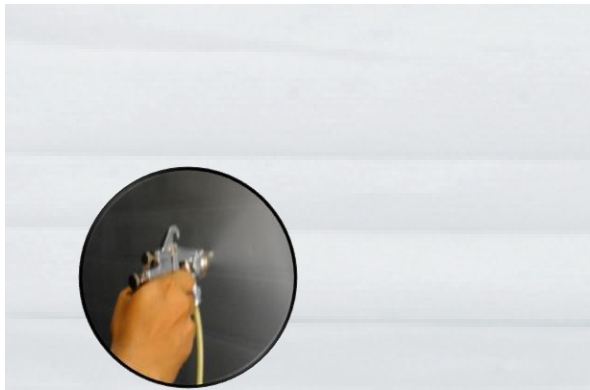
It is a product applied with the pure domestic technology(Registered Patent No 10-1615713 Eco friendly inorganic coating agent composition and application technology of Manufacturing the composition.

It is expected to greatly help eliminate and prevent Covid 19 nationwide by applying it onto walls, ceilings and floors of public facilities vulnerable to the virus.

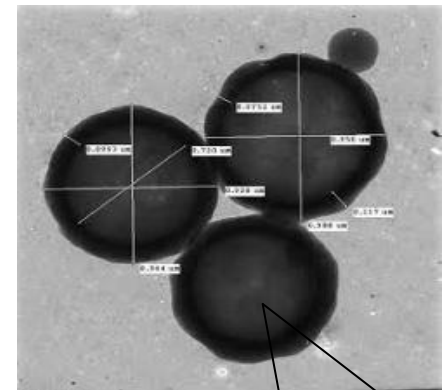
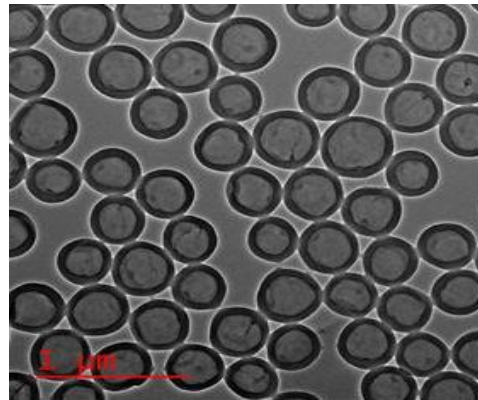
## 2) Sterilization Process

### ■ Spray Coating

○ NWK A-BMV has different size Egg Shell



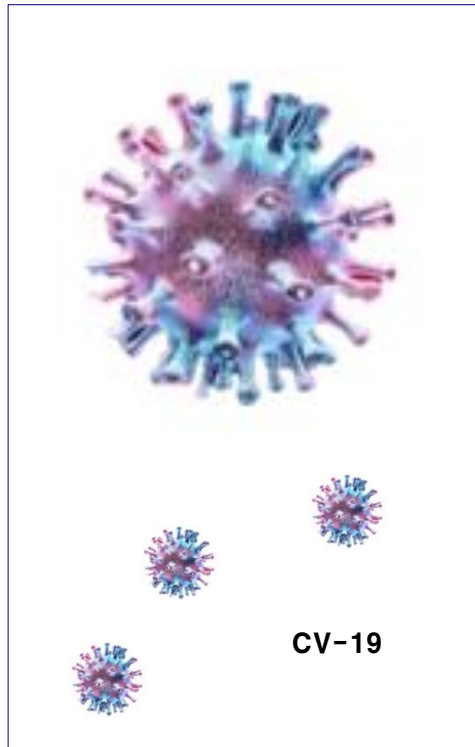
e.g.) The process of coating with a sprayer



An image of the result of penetrating the sterilization BMV based on Nano Particles into the Coating Agent (Scale 50,000)

**Three-Year Long Sterilization**

### 3) Features of the Product



**Protecting  
People' s Lives**

- **Protecting People' s Lives from Various Germs including **Covid-19****

- The sterilizing substance penetrates into germs and viruses and destroys and kills their protein structures.

**Technology**

- **Pure Korean Coating Technology that Turns the Natural Sterilizing Substance into Nano Particles**

**Safety**

- **Natural Substances**

**Economic  
Feasibility**

- **Five-Year-Long Sterilization Once Coated**

**Eco-Friendly**

- **Harmless to the Human Body**

## 2. Product Quality (Related to Original Products)

### 1) Moisture Resistance, Acid Resistance, etc.

#### 1) Results of Testing Resistance to Moisture, Impact, Acid, and Contamination

- The results of the evaluation based on the Korea Electric Power Corporation Standard Specification ES-9905-0015 are as indicated in the table below:

(Test Method: KEPCO Standard Specification ES-9905-0015/Jul. 31, 2019)

Test Items	Standard	Result	Test Method
• Moisture Resistance Test (24 hr)	No Swelling of the Painted Film	Ok	※ES-9905-0015 is the standard to apply to the paint used to color the surface of an exposed ground device used for the purpose of attaching advertisements and preventing damages.
• Impact Resistance Test (Impact Diameter:12.7mm, Height:20cm, Weight:300g)	Nothing Peeled Off	OK	
• Acid Resistance Test (to See if there is Corrosion after applying 10% hydrochloric acid (HCL), 24h)	Nothing Peeled Off	OK	
• Contamination Resistance Test (Carbon Contamination, (80±2) °C, 1h) Color Difference	Less than 8 in Color Difference(ΔE)	0.3	
• Contamination Resistance (Muddy Water Contamination. 1h) Color Difference	Less than 8 in Color Difference(ΔE)	0.1	

#### 2) Salt Water Spray Test (2000 Hours) and the Exterior (Rust + No Sand Blast)

Test Item	Unit	Test Standard	Result	Note
• 2,000 Hours After Spraying Salt Water	-	-	No Visible Rust, but Cracks	(22±2) °C. (50±10)% R.H.

Before



After

### 3) Results of Testing Wall Paint Adherence Strength, Resistance to Repeated Cold and Hot Temperature, Resistance to Washability

- Outstanding quality has been confirmed by the result of testing wall paint adherence strength, resistance to repeated cold and hot temperature, and resistance to washability based on KSF 4175:2001.

(Test Standard: KS F 4715:2001/Jan. 28, 2019)


Test Items	Unit	Test Standard	Result	Note
• Resistance to Repeated Hot and Cold Temperature - Adherence Strength	MPa	Over 0.4N/mm <sup>2</sup>	3.1	(20±2)°C. (65±20)% R.H.
• Resistance to Repeated Hot and Cold Temperature - Exterior	-	The test specimen should be free from peeling, fine cracks, swellings, significant discoloration and gloss deterioration.	ok	
• Resistance to Washability	-	It should be free from peeling and the bottom shouldn' t be exposed due to abrasion.	ok	

- ※ Testing the Resistance to Repeated Hot and Cold Temperature?  
A test to see if there is a crack on the surface of the concrete in winter after repeating freezing and melting it by 10 times.

## 2) Fungal Prevention

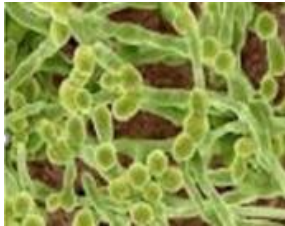
### 1) Results of Testing *E. coli*, yellow *Pseudomonas aeruginosa* and yellow staphylococci

- More than 99.9% of the antimicrobial power has been confirmed by the antimicrobial test performed by Korea Conformity Laboratories (KCL) (Test: Oct. 28, 2018)

Test Items (Germ Reduction Ratio)	Unit	Test Standard	Test Result	Temperature	Note
• <i>E. Coli</i> (after 24h)	%	KCL-FIR-1002 :2018	99.9	(37.0 ± 0.2) °C	
• Yellow pseudomonas (after 24h)	%		99.9		
• Yellow staphylococci (after 24h)	%		99.9		

### 2) Result of Testing Resistance to Fungus

- According to the result of the test conducted based on the KCL Health-Friendly Housing Construction Standards (Notification No. 2016-1084 of the Ministry of Land, Infrastructure and Transport), it has been confirmed that no fungus was formed after four weeks of cultivation. (Test Standard: ASTM D 6329-98/Nov. 1, 2018)

Items	Unit	Test Result	Actual Value	Temperature and Humidity	Note
• No. of Mold Spores	CFU/plate	<10		(29.0 ± 0.2) °C (92.8 ± 2.0)% R.H.	
• Resistance to Mold	Log Value	1.0	0		
• Test Evaluation Standard	1) CFU : Colony Forming Unit 2) Used Strain: <i>Aspergillus brasiliensis</i> ATCC 9642 3) Cultivated Hours: 4 Weeks				

### 3) Air Permeability of the Coated Surface: Closely Related to Resistance to Mold

Nov. 30, 2021

Test Item	Unit	Test Standard	Test Result	Note
• Air Permeability	%	-	57	(20±2)°C. (65±20)% R.H.
※ The air permeability of general paints is less than 10.				

(Korea Conformity Laboratories(KCL))



### 3) Preventing Fire Damage

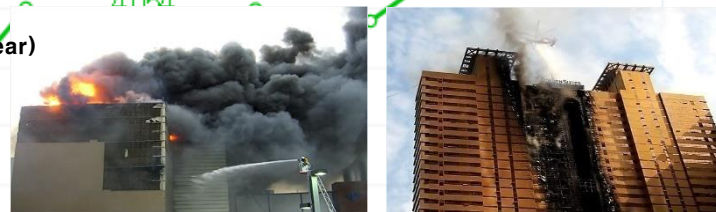
#### ■ A Fire?

- It may happen at any time in our everyday lives, causing enormous damage depending on where it takes place.
- In particular, it is most important to prevent a fire in advance as national protective facilities and public facilities (public housing, call centers, religious facilities, schools, hospitals, etc.) are especially vulnerable.

#### ■ Damages

- A fire can cause significant property damage and casualties within a short period of time.

Choking Accidents Caused  
by Smoke and Gas



## 1) Results of Testing Flame Resistance

- The results of the tests conducted based on the Article 5 (Fire Protection Performance Standard and Measurement Method) of the "Notice 2017-1" set by the National Emergency Management Agency showed that the product was outstanding in all categories, including the length of carbonation.
- Contents of the Flame-Resisting Performance: Plywood, fiberboard, wood and interior film-attached plywood.



(Test: KLC/Nov. 15, 2018)

Test Items	Unit	Test Standard	Test Result	Test Method	Note
• Length of Carbonization	cm	<20	1	Notice 2017-1" set by the National Emergency Management Agency	(20±1)℃, (54±1)% R.H.
• Size of Carbonization	cm <sup>2</sup>	<50	2		
• After-Glowing Time	s	<10	0		
• After-Flaming Time	s	<30	0		



## 2) Result of Testing Thermal Emission

- The results of testing thermal emission out of the flame-retardant materials stipulated in the Ministry of Land, Infrastructure and Transport Notice No. 2015-744 are as stated in the table below.

(Gas Toxin Test: KS F ISO 5660-1:2008/Nov. 27, 2017)

Items		Test Standard	Test Results			Test Method
			1 <sup>st</sup> Time	2 <sup>nd</sup> Time	3 <sup>rd</sup> Time	
• Thermal Emission Test	Total Thermal Emission(MJ/m <sup>2</sup> )	Less than 8MJ/m <sup>2</sup>	0.6	0.4	0.7	KS F ISO 5660-1:2008
	Time of Thermal Emission Continuously Exceeding 200kW/m <sup>2</sup> (S)	Less than 10s	0	0	0	
	Hazardous cracks, holes, and smelting (all melting, dissipation of the core material) penetrating the specimen	No Allowed	No	No	No	

## 3) Result of Testing GAS Harmfulness

- The result of the test on mice showed the safety was confirmed for more than 14.55 minutes from 9 minutes of the safety standard.

(Gas Toxin Test: KS F 2271:2016/Nov. 27, 2017)

Items	Test Standard	Unit	Result			
• Time of Mouse Stopping Moving	Over 9 minutes	min:s	Over 14:55 Minutes			
• Mouse Data			Test Data			
① Average Weight: 18~22g, ② 18~22g,			1 <sup>st</sup> Time	2 <sup>nd</sup> Time	3 <sup>rd</sup> Time	
③ Type: ICR, ④ Gender: Female, ⑤ Age: 5 Weeks			15:00	14:59	-	

(Test: KLC Test Institute)

## 4) Preventing the Generation of Harmful Substances

### 1) Result of Testing Heavy Metal Detection (Pb, Cd, Hg, Cr)

- KLC Test Institute conducted a detection test, and the result showed no heavy metal (less than detection limits), confirming that it is safe to the human body and has no environmental hazard.

(Test: Jan. 6, 2021)

Test Items	Unit	Test Method	Test Result
• Pb(Lead/Heavy Metal)	%	KS M ISO 3856-1:2007	Not Detected (Detection Limit 0.0005)
• Cd		KS M ISO 3856-4:2007	Not Detected (Detection Limit 0.0001)
• Hg		KS M ISO 3856-7:2007	Not Detected (Detection Limit 0.0001)
• Cr		KS M ISO 3856-5:2007	Not Detected (Detection Limit 0.0001)



## 2) Results of Testing the Disintegration of TVOCs, Toluene, Formaldehyde Test (1)

- The results of testing the disintegration of TVOCs, Toluene, Formaldehyde based on the indoor air quality test standard (KIS ISO 16000) is as stated in the table below. (Test Standard: KS I ISO16000-9:2014)

Test Items	Unit	Test Standard	Test Result
• TVOC	mg/m <sup>2</sup> ·h	2.0 or less Waterborne paint (waterborne and water-soluble)	0.056
• Toluene		0.08 or Less	Not Detected (Detection Limit 0.0025)
• Formaldehyde		0.02 or Less	0.003

Indoor Air Quality Test Standard (KS I ISO 16000)

Classification		VOCs	Toluene	Formaldehyde	
Standard (mg/m <sup>2</sup> ·h)	Waterborne Paint	Waterborne and Water-Soluble	2.0 or Less	0.080 or Less	0.02 or Less
		Water Slush and Emulsion	1.0 or Less		
	Oil-based Paint		0.80 or Less		
	Putty		4.0 or Less		

※ **Formaldehyde is a carcinogen.**

It is the first-class cancer-causing agent designated by IARC, the International Agency for Research on Cancer under the World Health Organization. It is because formaldehyde's powerful mechanism, formyl, attacks living cells or DNA, killing cells, degenerating proteins, and destroying DNA structures.

### 3. Product Specifications

Items	Details
• Main Components	<b>Silicate, PUD, Modified Polydimethylsiloxane, Edible Natural Oil, Additives</b>
• Viscosity(CPS)	<b>Max 110</b>
• Flashing point(°C)	<b>No</b>
• Color	<b>Transparent Color</b>
• Standard Use(kg/m <sup>2</sup> )	<b>0.05~0.06(2 times)</b>
• Pot life(hours)	<b>No limit</b>
• Touch Time / Racky free(Min)	<b>20mins</b>
• Expiration	<b>1 year (enclosed room temperature)</b>

# 4. How to Use

## ■ On the Surface of Cement, MDF, Aluminum, Metal

Classification	Details
• Product Name	NWK A-BMV
• Coating Thickness	Min(30) $\mu\text{m}$ , Max(50) $\mu\text{m}$ $\rightarrow$ Metal(Non absorption) Min(40) $\mu\text{m}$ , Max(60) $\mu\text{m}$ $\rightarrow$ Cement, Wood(absorption)
• Package	20kg, 200kg, 1,000kg IBC
• Work Tools	Air less, Diaphragm Pump, Roller & Brush etc.

## ■ Coating Tools



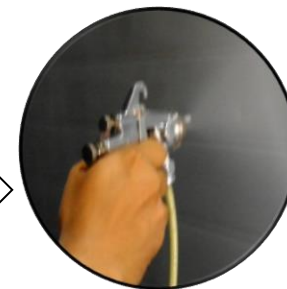
[Air less]



[Compressor]



[Diaphragm Pump]



[Spray Gun]



[Roller & Brush]

# 5. Applications



- Hospitals (Emergency Rooms, Hallways, etc.)
- Companies (Meeting Rooms, Restaurants, Dormitories, Training Centers, etc.)
- Schools, Private Institutes (Lecture Rooms)
- Hotels, Resorts
- Travel Agencies (In Vehicles)
- Broadcasters (Open Halls etc.)
- Religious Facilities (Churches)
- Highway Lounges and Restaurants
- Call Centers
- Gyms
- Military (Barracks, Restaurants, Submarines)
- Subway Platforms and Inside Cars

