

Green Building Congress 2022

EVOLUTION OF PAINT TOWARDS GREENER HOME



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Director R&D



WE WILL DISCUSS...

- ❖ AIR QUALITY INDEX
- ❖ VOC: DEFINITION, SOURCES, SIDE EFFECTS
- ❖ FORMALDEHYDE: DEFINITION, SOURCES, SIDE EFFECTS
- ❖ PAINT TO IMPROVE INDOOR HYGIENE
- ❖ TECHNOLOGY TO IMPROVE COATINGS TO ACHIEVE INDOOR HYGIENE
- ❖ ACTIVE CARBON TECHNOLOGY
- ❖ SILVER ION TECHNOLOGY
- ❖ ANTI BACTERIAL AND ANTI MICROBIAL TECHNOLOGY
- ❖ UNIQUE ABSORPTION TECHNOLOGY
- ❖ NEW GENERATION SEALANTS



AIR QUALITY INDEX

Air quality is measured with the Air Quality Index, or AQI. The AQI works like a thermometer that runs from 0 to 500 degrees. However, instead of showing changes in the temperature, the AQI is a way of showing changes in the amount of pollution in the air. Air quality is a measure of how clean or polluted the air is.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

Pollutants in Our Space



VOC

WHAT IS **VOC??**

VOC is any organic compound that evaporates readily to the atmosphere at room temperature, e.g. Carbon monoxide, carbon dioxide, alcohol, gasoline, etc.

SOURCES OF VOC EMISSION



INDOOR VOC CONTRIBUTORS..

SOURCES

VOCs are widely used in household and commercial products.

- SOME CLEANSERS
 - WAXES
 - PAINT , VARNISHES PRESERVATIVES
 - DRY CLEANING PRODUCTS
 - DISINFECTANTS
 - GLUES
 - CIGARETTE SMOKE AND PESTICIDES.
 - GASOLINE, KEROSENE AND OTHER FUELS
-

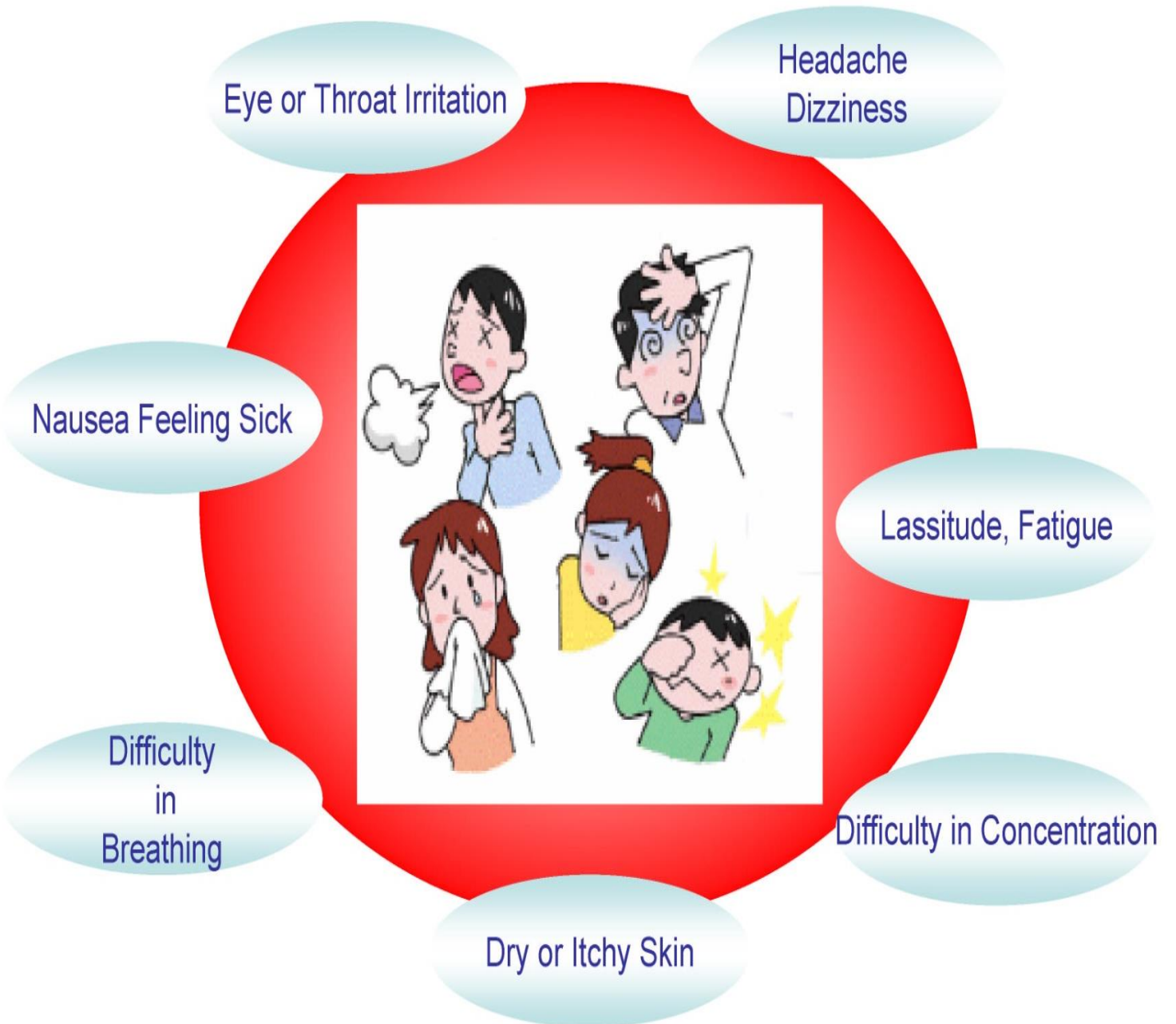
Although VOCs can be found in both outdoor and indoor settings, the levels of VOCs found indoors can be much higher than those found outdoors. This is because a house or building that doesn't have enough ventilation does not allow potential indoor pollutants to escape.

Generally, the air outside naturally dilutes VOCs. Outside exposure to VOCs tends to be more common in urban settings from sources like bus or automobile exhaust.



EFFECTS OF VOC..

There Are acute health effects of major indoor contaminants

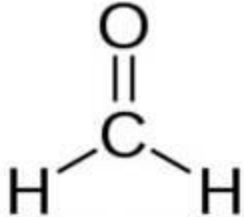
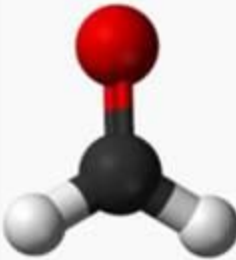



INDOOR AIR POLLUTANT: **FORMALDEHYDE**

Formaldehyde is a colorless gas with strong pungent odor, can easily dissolve in water, alcohol or ether etc. It has been confirmed as carcinogenic by World Health Organization.

It's also one of the large family of chemical compounds called Volatile Organic Compounds.

It can be detected by many individuals at parts per million (ppm).

Formaldehyde	
	
	
IUPAC name	
Other names	formol, methyl aldehyde, methylene oxide, methanal



SOURCES OF FORMALDEHYDE

- FURNITURE, FLOORING, STAIRS, CABINETS AND MORE
- CARS AND TRUCKS
- INKS
- WRINKLE-FREE CLOTHING



WHY IS FORMALDEHYDE HARMFUL?

➤ Research has determined that carpets, furniture, textiles, construction glues, insulation materials have formaldehyde releasing periods of 3 ~15 years into the indoor air when the temperature and humidity change.

- 0.05 – 0.06 ppm – Children may breathe heavily
- ~ 0.08 ppm – Adults will sense a peculiar smell & feel uncomfortable
- ~ 0.4 ppm – Eye Irritation /lachrymation (excessive tearing)
- ~ 24.6 ppm – Fatal to Human Health Eg: Cancer



Quick Fact: One in five people are sensitive to formaldehyde.



DEFINITIONS OF VOC IN DIFFERENT COUNTRIES			
EU	Boiling point =<250°C measured at a standard pressure of 101.3 Kpa		
	Interior flat: 75 g/L Interior non flat: 150 g/L	Exterior flat: 75 g/L High Gloss: 150g/L	
CHINA GB	A vapor pressure =>0.01mmHg at 20°C		boiling point =<250°C measured at a standard pressure of 101.3 Kpa
	GB18582-2006 Interior: 120 g/L	HJ/T201-2005 Interior 80g/L Exterior 150 g/L	
US	Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions		
California	Flat: 50g/L		Non-flat :50g/L
AUSTRALIA	A vapor pressure >0.01mmHg at 21°C, or		An initial boiling point <250°C measured at a standard pressure of 101.3 Kpa.
	Interior flat 70g/L Interior low sheen 75g/L Interior semi-gloss 80g/L Interior Gloss 90g/L	Exterior flat 70g/L Exterior non-flat 80g/L Exterior non-flat 80g/L	



RELEVANCE OF VOC IN PAINT INDUSTRY

Active solvents: Ketone (Dissolve the colours/resins), Acetates

Non Active (Thinners): Mineral spirit, Alcohol,

Aromatic(To reduce viscosity of the paint): Toluene, Xylene,
Naptha

Conductivity Material (To increase the conductivity of the paint):
Alcohols

USE OF SOLVENTS IN WATER BASED PAINT

Used in surfactants: Which are important for increasing the surface related properties

Coalescing agents like Texanol, glycol, propylene glycol, mono ethylene glycol and glycol ethers are used for making a continuous film after evaporation of water. This will give very good film properties like resistance to water and stains and scrub resistance.

Its helps to use high Tg polymeric emulsion for better durability.

WHAT MAKES THE COATING IMPROVED??

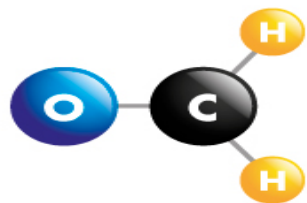
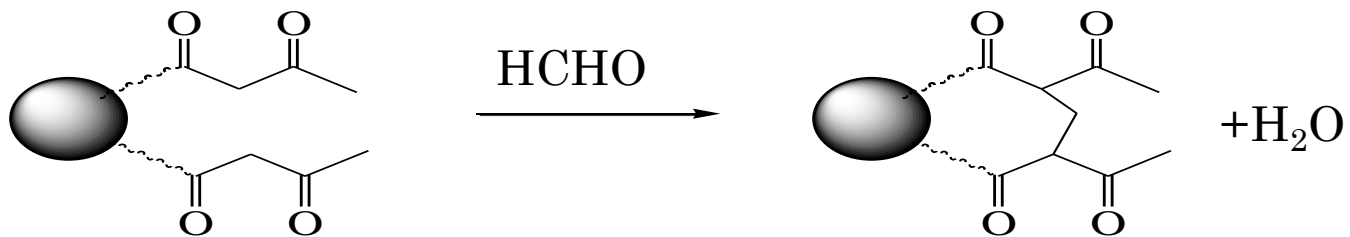
ACTIVE CARBON TECHNOLOGY

SILVER ION TECHNOLOGY

ANTI MICROBIAL TECHNOLOGY

UNIQUE ABSORPTION TECHNOLOGY

ACTIVE CARBON TECHNOLOGY



1 | Formaldehyde is absorbed into AirCare
Formaldehid diserap ke dalam AirCare
 甲醛被AirCare吸收

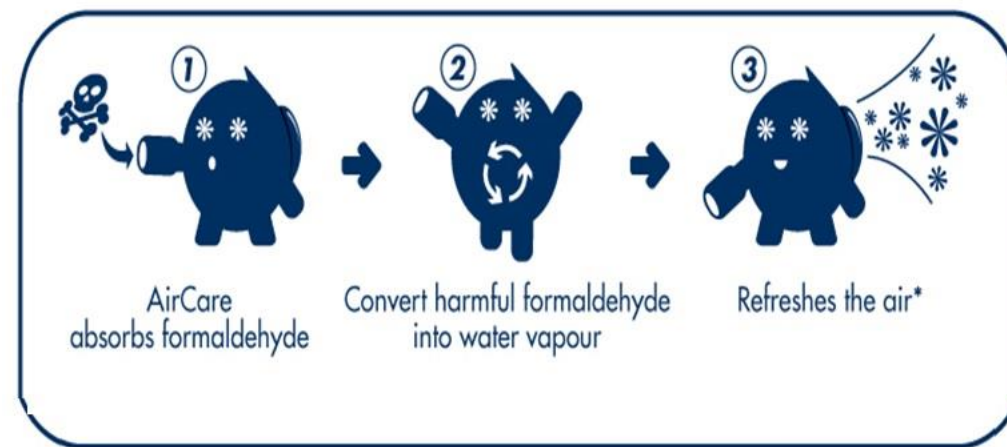


2



3 | AirCare releases water vapour
AirCare melepaskan wap air
 AirCare释放水蒸气

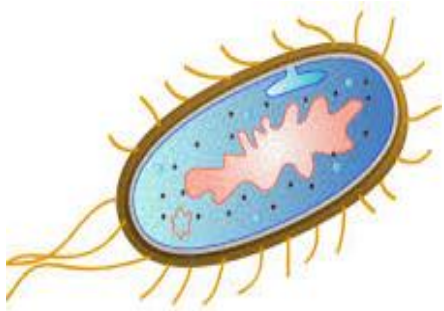
Wall coated with AirCare
Dinding dicat dengan AirCare
 髹上AirCare的墙面



RELEASE OF WATER VAPOR REFRESHES THE AIR



ANTI BACTERIAL AND ANTI MICROBIAL TECHNOLOGY



Escherichia coli

This bacteria is one of the normal flora of healthy individuals.

Infections: **diarrhea, urinary tract infections, Meningitis Pneumonia**, And also some stains Escherichia coli produce toxin, which is lethal as it could lead to **kidney failure, fever, bleeding**



Staphylococcus aureus

This Organism is also a common inhabitant of nasal tract and skin of healthy minor may cause skin infections Pneumonia, Meningitis, Osteomyelitis, Endocarditis toxic shock syndrome Bacteraemia, Sepsis

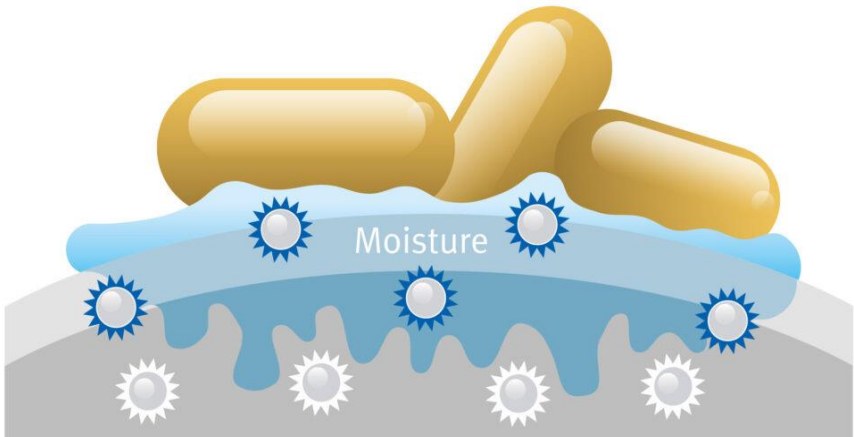


Antibacterial property in a paint destroy or inhibit the growth of microorganisms, especially those that are pathogenic.

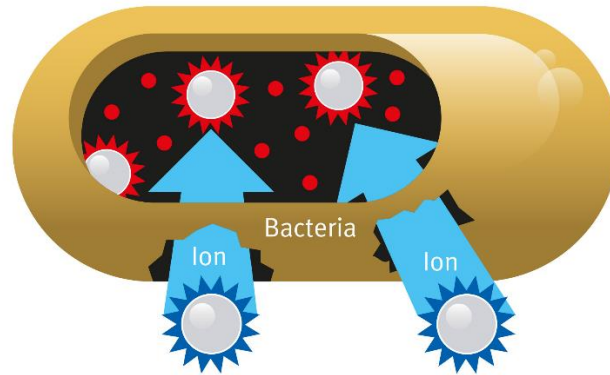


SILVERION

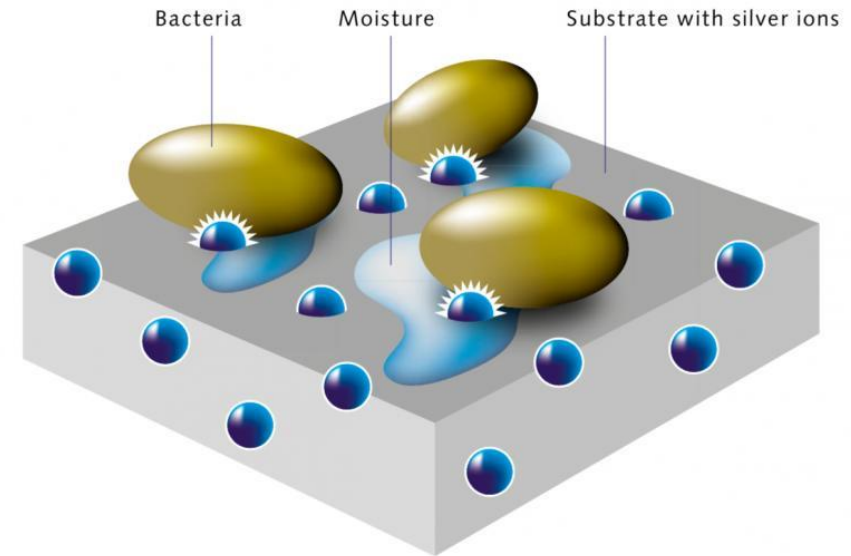
TECHNOLOGY



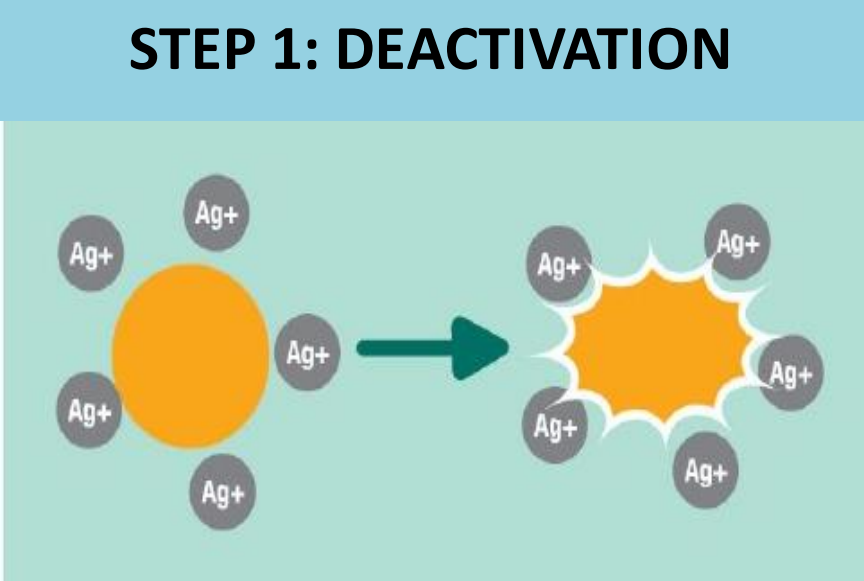
Silver ions embedded in the paint are released via ambient moisture and enter the cell membrane



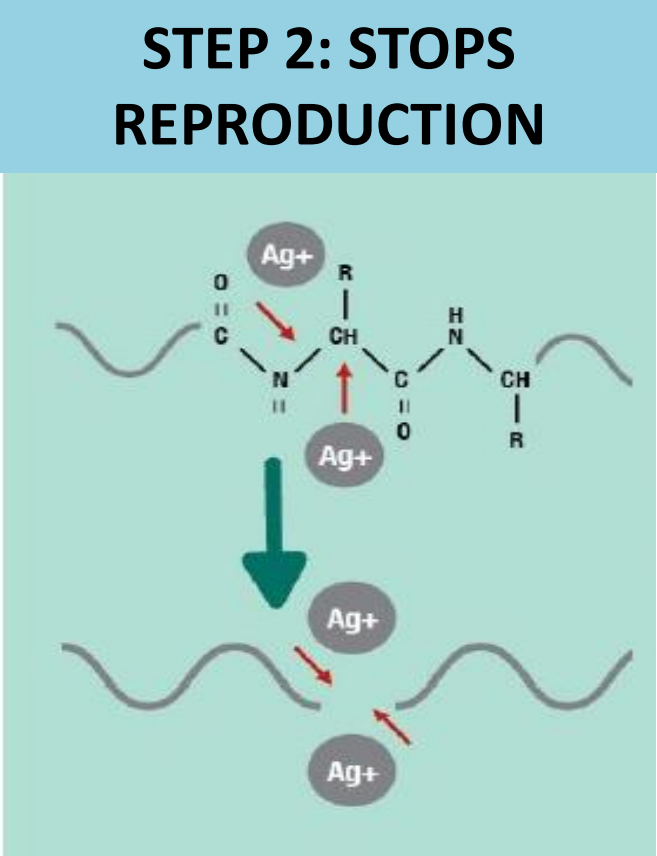
Silver ions destabilise cell membrane, stop respiration and inhibit cell division, whilst blocking the respiration of DNA



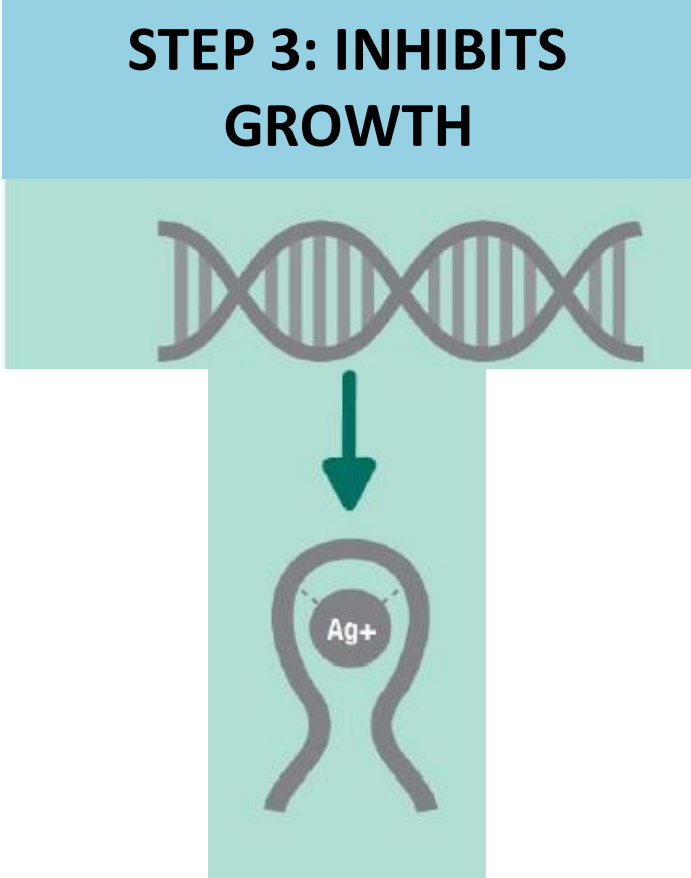
Mechanism of Silver Ion Technology Against Bacteria & Viruses



Destroy the cell membrane of viruses & bacteria, making them non-functional.



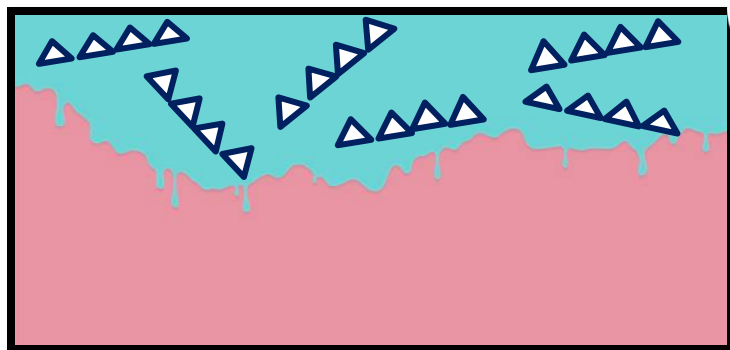
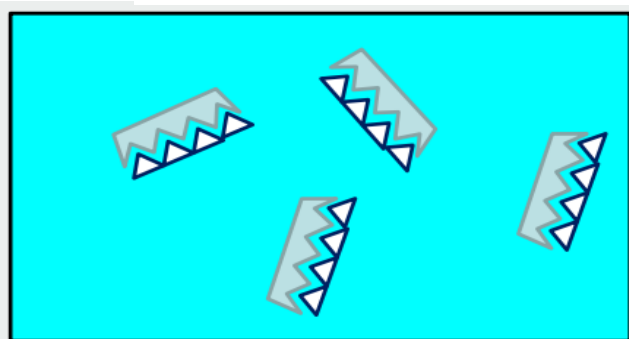
Stops viruses & bacteria from reproducing & multiplying.



Slows down the metabolism & eventually causes the death of viruses & bacteria.

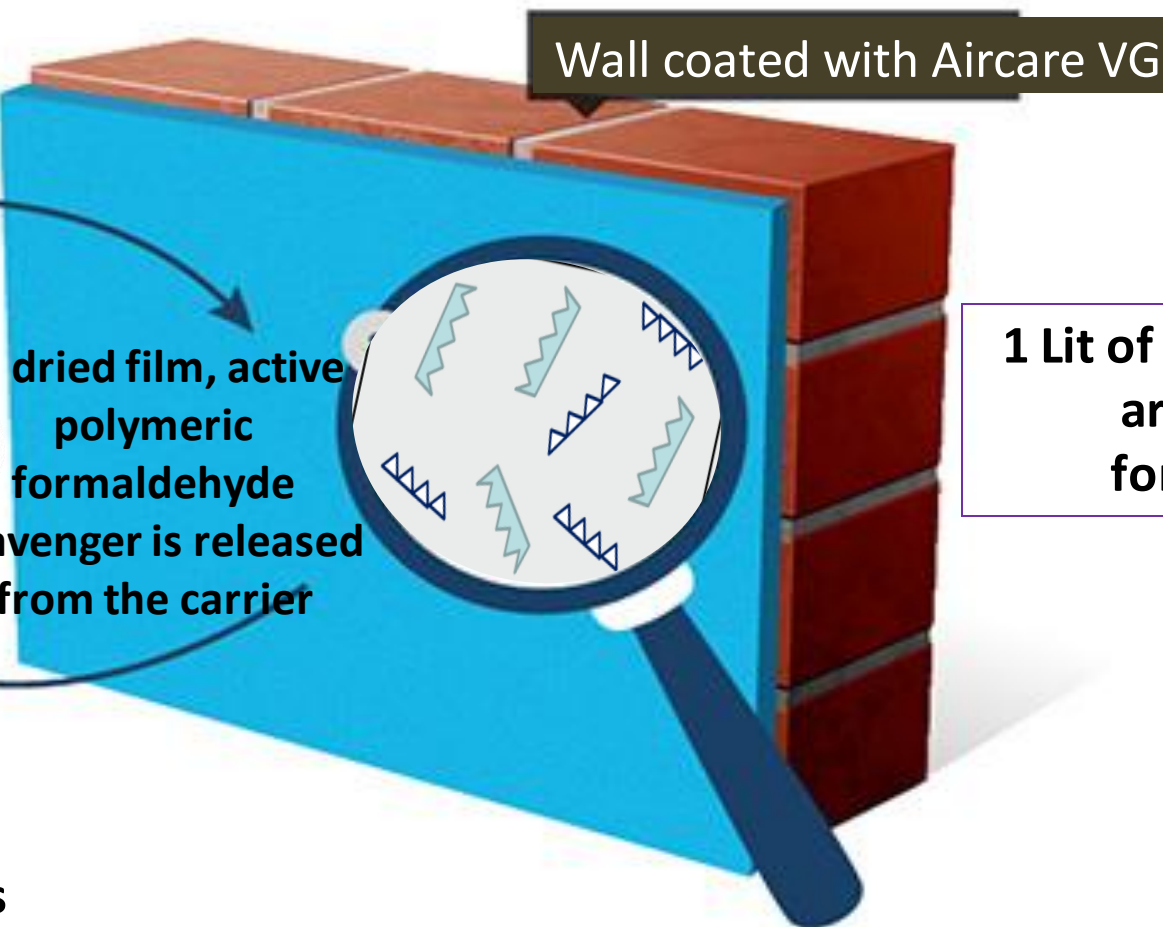
UNIQUE ABSORPTION TECHNOLOGY

1 In wet paint, the HCHO scavenger active is attached to carrier



3 Active carrier reacts with HCHO & forms polymeric complex which is harmless.

2 In dried film, active polymeric formaldehyde scavenger is released from the carrier



1 Lit of paint can absorb around 1 g of formaldehyde



 **NIPPON
PAINT**
Inspired by you

Aircare VG



AIRCARE VG

- Anti-formaldehyde (Unique Absorption Technology)
- Antimicrobial (Silver Ion Technology) & Antifungal
- Superior scrub resistance & washability
- Stain resistant
- Ultra low VOC & low odor
- Green choice (environmentally friendly)



Eco sensitive
commercials



Green certified
Buildings



Hospitals



Homes



Residential spaces



Commercial
spaces



GREEN ASSURED



REASON'S TO BELIEVE - ANTI BACTERIAL AND ANTI-VIRAL CLAIM

- National health Academy certifying Silver Ion Technology.
- Antiviral Certification from Biotech Testing Services
- Protection from the Human Coronavirus Certificate.

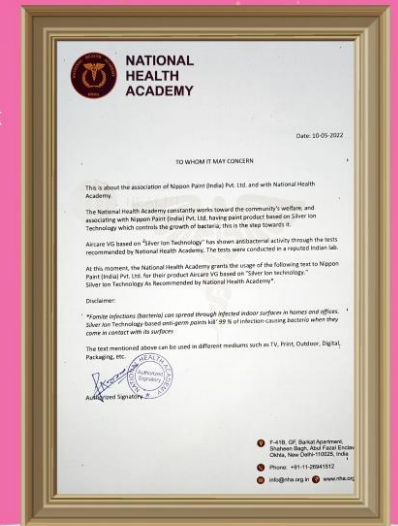


AIRCARE VG
ULTRA LUXURY ANTI-MICROBIAL EMULSION

NIPPON PAINT
Inspired by you

AIRCARE VG IS NHA-CERTIFIED!

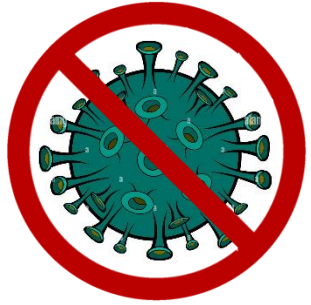
We're super happy to tell you that Aircare VG is finally NHA-certified and will be hitting the market soon. We thank you for your hard work in making this happen. Let's now keep our eyes on the journey ahead. We're pretty sure Aircare VG will come out with flying colours.



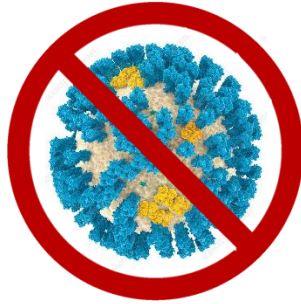
● F-418, Old Bapuji Apartment,
Bhamburda Road, New Delhi-110025, India
● Phone: +91-11-26943132
● info@nha.org.in ● www.nha.ac

Which Viruses and Bacteria Does it Destroy?

Enveloped virus



Human coronavirus
HCoV 229E1



Influenza A virus
(H3N2)

Bacteria



Escherichia
Coli



Staphylococcus
aureus



Pseudomonas
aeruginosa

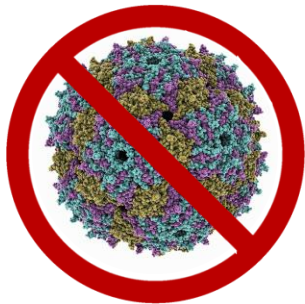


Klebsiella
pneumoniae

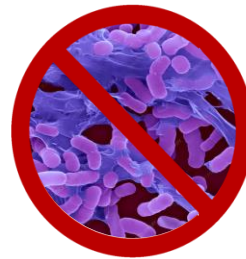


Streptococcus
pneumoniae

Non-enveloped virus



MS2 Bacteriophage



Acinetobacter
baumannii



Enterobacter
aerogenes

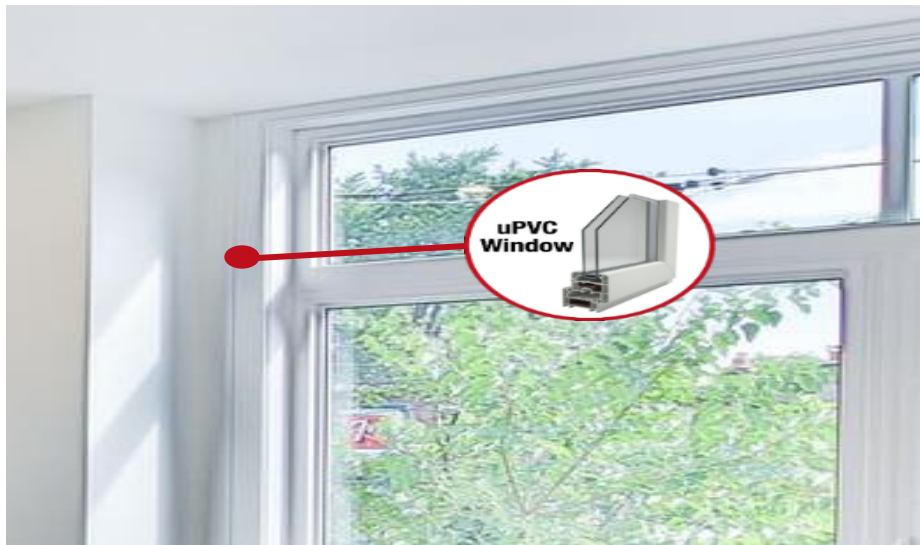


Listeria
monocytogenes



Citrobacter
freundii

'V-tech' Acrylic Sealant VT-223 Ultra Flex Gap Sealant



- ✓ 25% movement capability
- ✓ Exterior & Interior sealant applications
- ✓ UV resistant
- ✓ Low VOC compliant Paintable
- ✓ Permanently flexible & easy clean up
- ✓ Applications - Window Joints, Cabinet and Wardrobe Installation, Penetration Gap Sealing

APPLICABLE TESTS/STANDARDS

- SGBPLS compliant • Low VOC
- ✓ **Ideal for uPVC Window installation**



'V-tech' Neutral Silicone VT-212 Sanitary Sealant

- ✓ Neutral curing system
- ✓ **Anti-Fungus - ASTM G21**
- ✓ FDA Tested (Food contact safe)
- ✓ Color – T & W
- ✓ For humidity areas
- ✓ Cleanroom – Pharma & Food

APPLICABLE TESTS / STANDARDS

- ASTM G21 (Anti-fungus) • BS 5889:1989, Type F
- FDA 21 CFR Part 175.300 (Food contact safe)
- Low VOC



Singapore Green Building Products Labeling Scheme (SGBPLS Certification)



VT-210

VT-211

VT-220

VT-626





**#All
Colours
Are
Green**

THANK YOU!!



Analysis System--Indoor Air Quality



HCHO Removal Efficiency Evaluation



Odor Assessment Instrument



Air Pollution Detecting



IAQ lab (Sensory lab and GC-O-MS lab)

Objective System

GC-O-MS



Subjective System



Sensory Lab



IAQ lab

