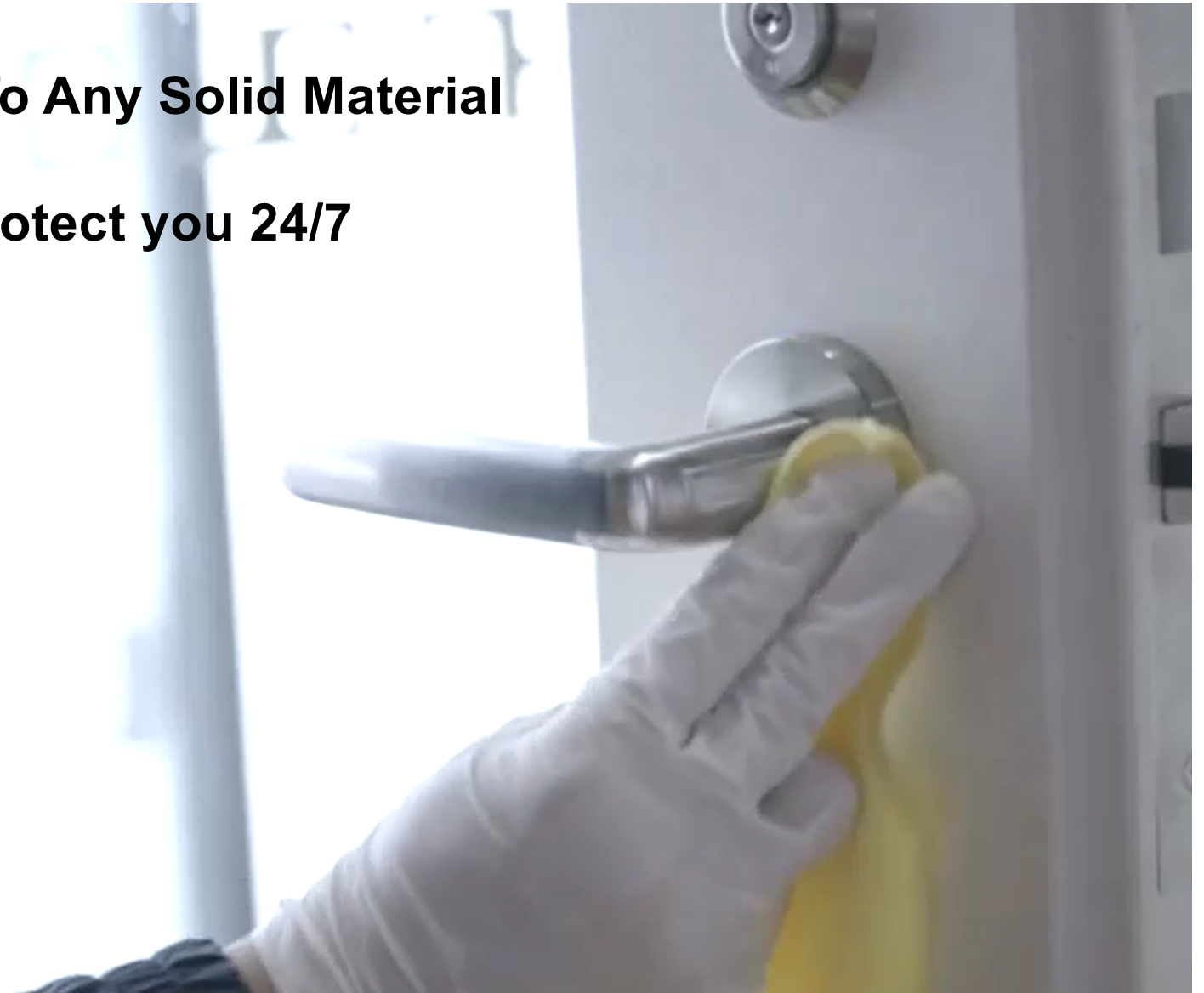




Anti-Virus and Microbial Nano Glass Coating Technology From JAPAN

Antiviral Coating To Any Solid Material

Transparent but protect you 24/7



Dr. HardoLass Disinfectant & Anti-virus coating



Dr. HardoLass Disinfectant for spraying

Effective for 30 days

**Killing viruses at the moment after spraying.
Virus prevention effect lasts for 30 days
compared to normal virus bleach spray.**



Dr. HardoLass Anti-Virus Coating

Anti-virus for 5 years more

**Suppressing viral spread 24/7 for 5 years.
Ultra strong resistance against continuous
daily use friction with Ultra-hard coat.**

Introduction: Dr.HardoLass



Anti-Virus and Microbial Nano Glass Coating Technology From JAPAN



A high purity nano-glass coating agent made in Japan. This glass coating can prevent dirtiness, scratches and is water repellent. It can also prevent bacteria and virus infections.



Anti-dirt

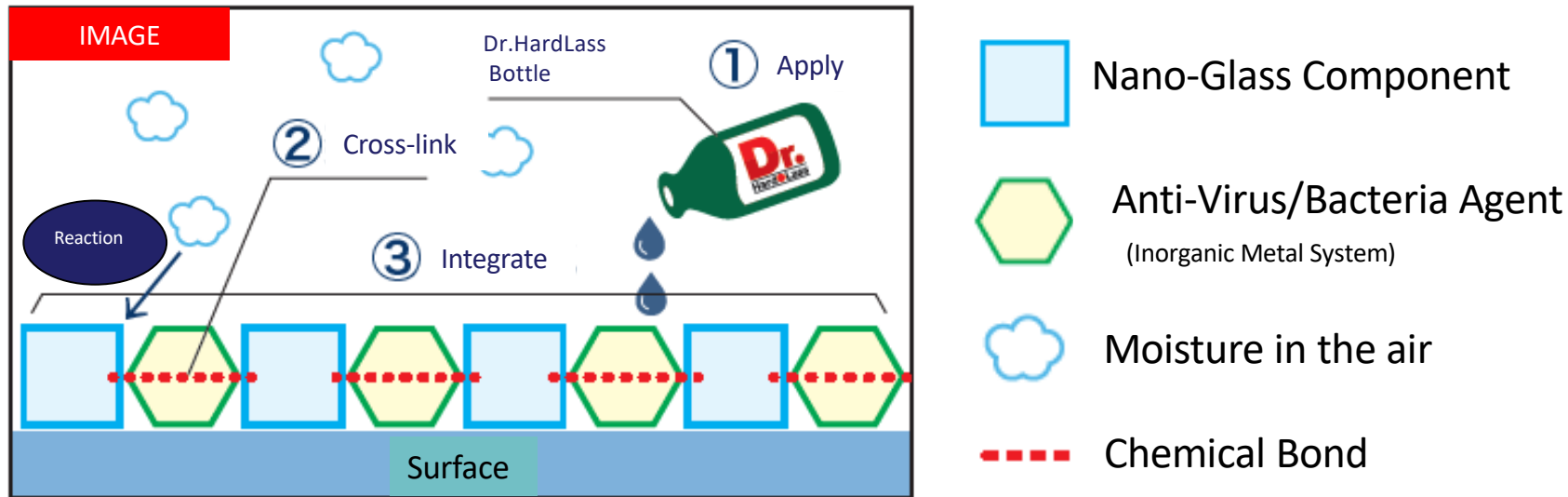
Water-repellent

Anti-scratches

Anti-Viral

Anti-Bacterial

The Mechanism: The Formation of a Nano-Glass Layer



① Apply

The components stick to the surface by rubbing the coating agent against it.

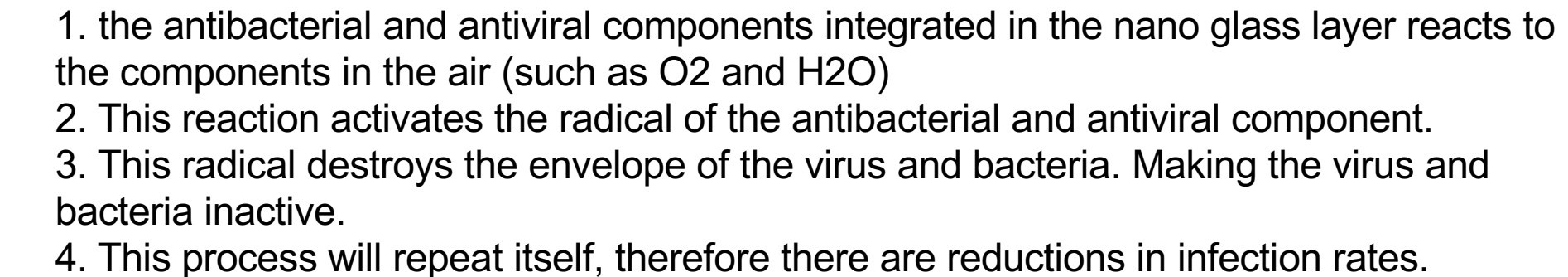
② Cross-link

Moisture in the air reacts with the nano-glass component, which creates a chemical bond. The bond allows the nano-glass components to connect to each other, which forms into a nano-glass layer.

③ Integrate

Antibacterial/antiviral components integrate into the chemical bond of the nano-glass component.

Dr.
HardLass



Industry-academia collaboration

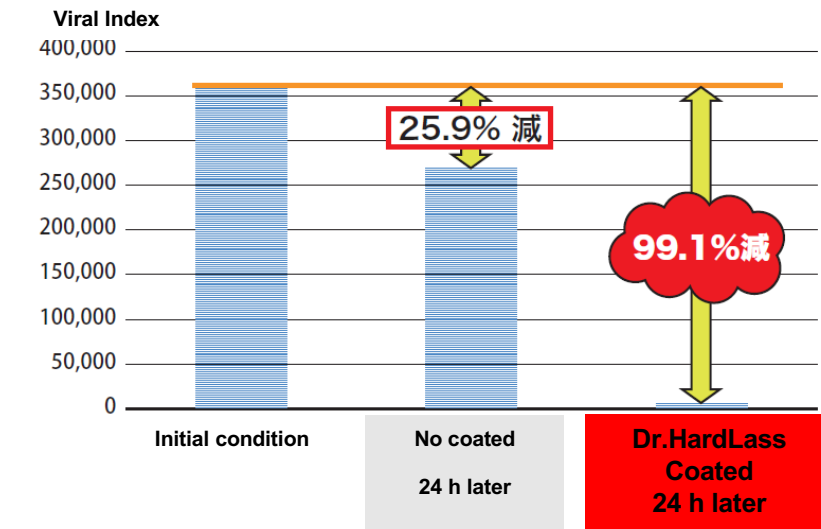


Shimoshima Laboratory, Waseda University / Faculty of Science and Engineering
(Development of new materials by molecular design)

Research with Tokyo Metropolitan Industrial Technology Research Institute (TIRI)
/Surface Chemistry Group (selection of various additives)

Kisarazu National College of Technology/Mechanical Engineering Department Fluid Laboratory
(Development of air resistance reduction method)

Anti-Virus Effect certified



【 Influenza Virus 】

None-coated sample observed no change of anti-virus activity.
→no viral disinfection

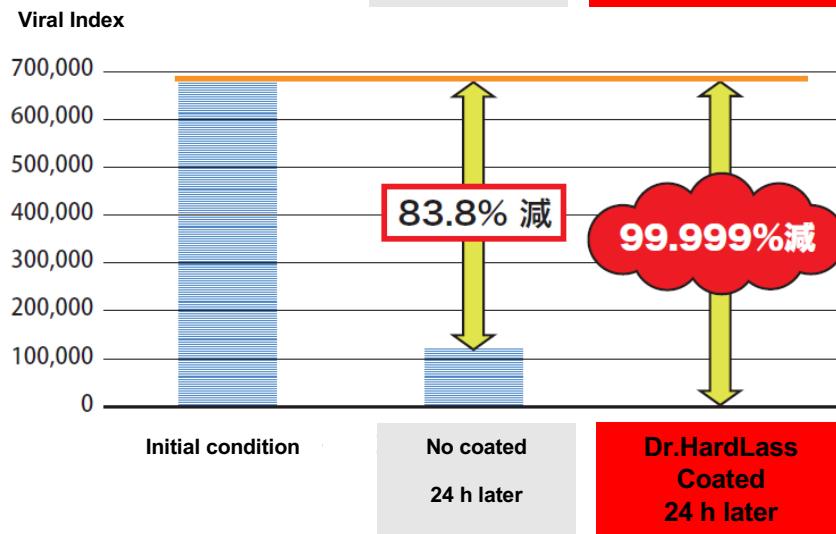
Test title : Anti-viral activity test

Test Method : ISO21702:2019

Test sample : Influenza Virus

Anti-Viral Activity 1.8

(reported in test result on 9th March 2020)



【 Feline silica virus 】

Significant anti-viral activity observed in sample 24 hours monitoring
→Huge Viral suppression proved.

Test title : Anti-viral activity test

Test Method : ISO21702:2019

Test sample : Feline silica virus

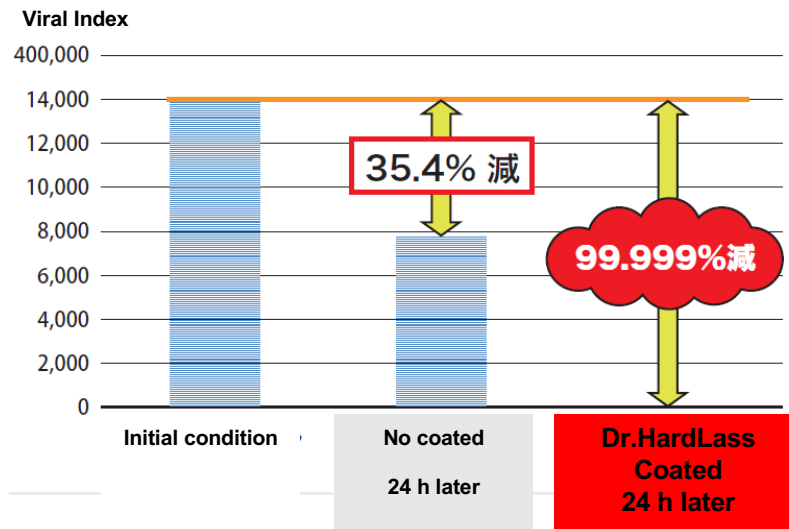
Anti-Viral Activity 4.1

(reported in test result on 9th March 2020)

Anti-Viral Activity : parameter indicating level of virus suppression.

Ex. Antiviral activity 4.1 → 1×10^4 virus reduction observed (meaning 99.9999% reduction)

Anti-Bacteria Effect certified



【 Staphylococcus aureus】

Reduction reached below observable level !

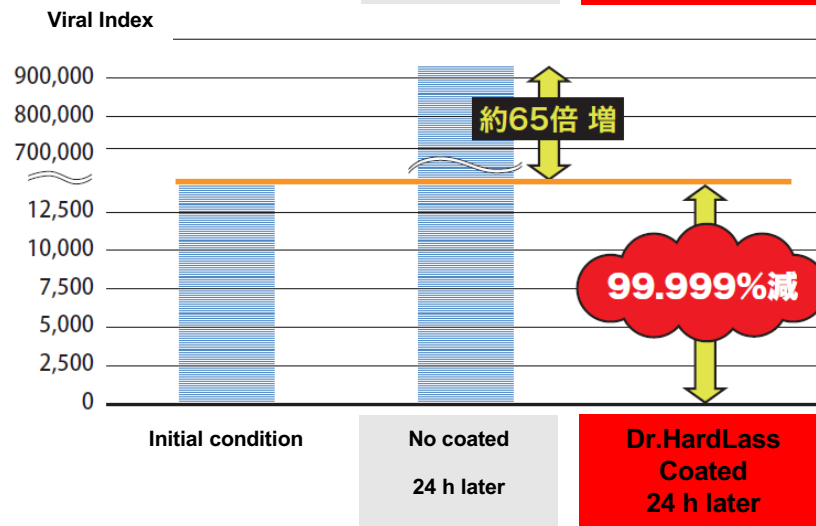
Test title : Anti-bacteria activity test

Test Method : JIS Z 2801

Test sample : Staphylococcus aureus

Anti-Bacteria Activity 4.3

(reported in test result on 16th Dec 2019)



【 Escherichia coli】

Reduction reached below observable level !

Test title : Anti-bacteria activity test

Test Method : JIS Z 2801

Test sample : Colitis germ

Anti-Bacteria Activity 6.2

(reported in test result on 16th Dec 2019)

Anti-Bacteria Activity : parameter indicating level of bacteria suppression.

Ex. Antibacteria activity 4.1 → 1×10^4 virus reduction observed (meaning 99.9999% reduction)

Proven by a third-party organization ① Anti-virus



無機抗菌剤・練込
本体
JP0612381A0002Y

For anti-virus performance and safety Clear the SIAA standard

A certificate from a third party has already been obtained. These are international standard ISO21702 method applied and Evaluated by (anti-virus) Base.



About SIAA



Established in 1998, the institution consisted of more than 160 prominent leading companies of Nanotechnology. The institute has its own technical regulations with its focus on safety and quality control.



Proven by a third-party organization ② Anti-bacteria



無機抗菌剤・練込

本体

JP0122381A0001T

- ・「製品上の特定ウイルスの数を減少させます。」
- ・「抗ウイルス加工は、病気の治療や予防を目的とするものではありません。」
- ・「SIAAの安全性基準に適合しています。」

For anti-bacteria performance and safety Clear the SIAA standard

International standard ISO22196 method certified (antibacterial) Based on the results Our products also have antibacterial performance with evidence



About SIAA Safety Regulation

- Immediate Oral Toxicity
- Toxicity against skin
- Damage against DNA
- allergic test

About SIAA Anti-bacteria certificate

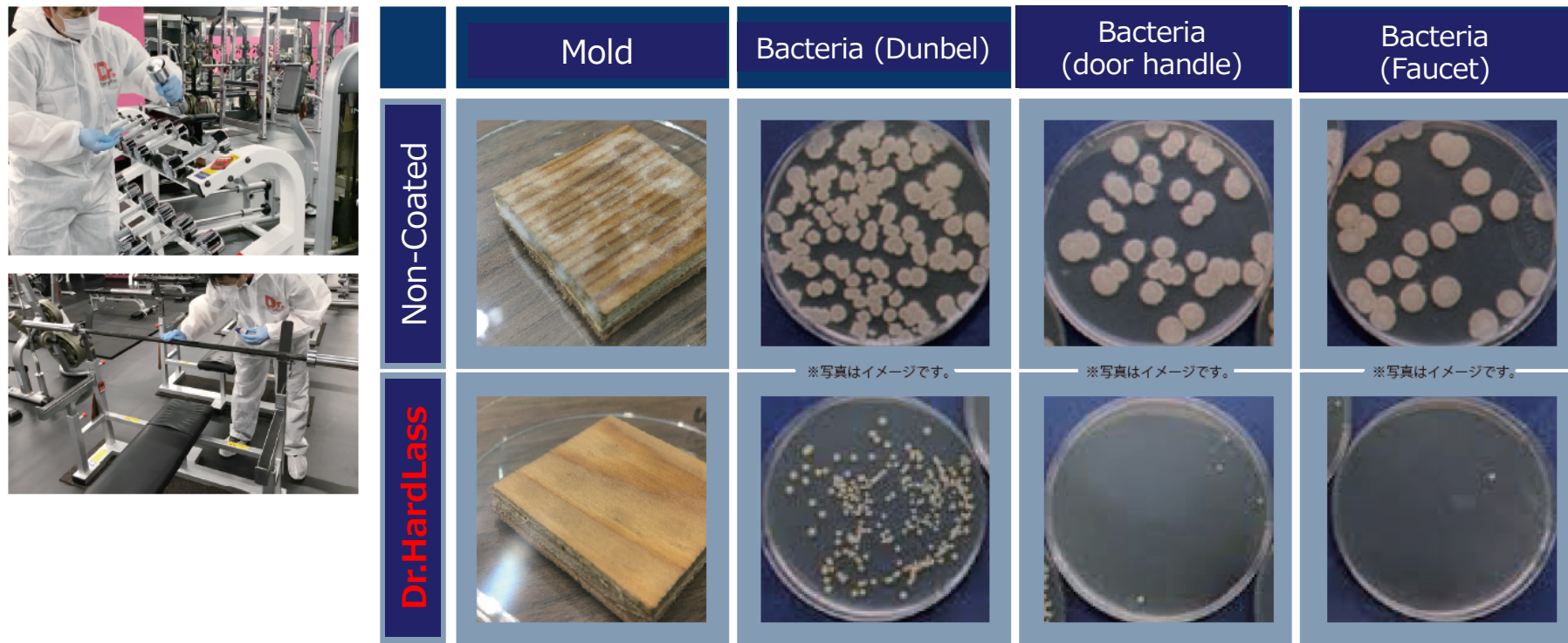
One of requirements is less than 1/100 bacteria compared to the surface of non-antibacterial products and the antibacterial effect remains after the durability test. The result is confirmed. Antibacterial property conforms to international standard ISO22196 method.

Long lasting effectivity (5 years and more)

When we compare mainstream disinfectants and Dr. HardoLass, mainstream disinfectants only disinfect during application, while Dr. HardoLass has a prolonged disinfecting length due to the antiviral and antibacterial components.

Mold infection test result in **3 months**

Comparison of Food Articles placed on Hardolass coated surface and non coated surface

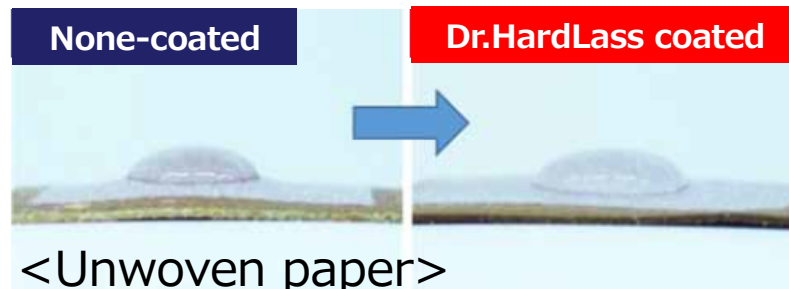


Product life time of 5 years based on the result of accelerated weathering test

Durability Test

Dr.HardLass Coating Layer for 5 years and more!

Test conducted on multiple type of material.
Measured condition difference.

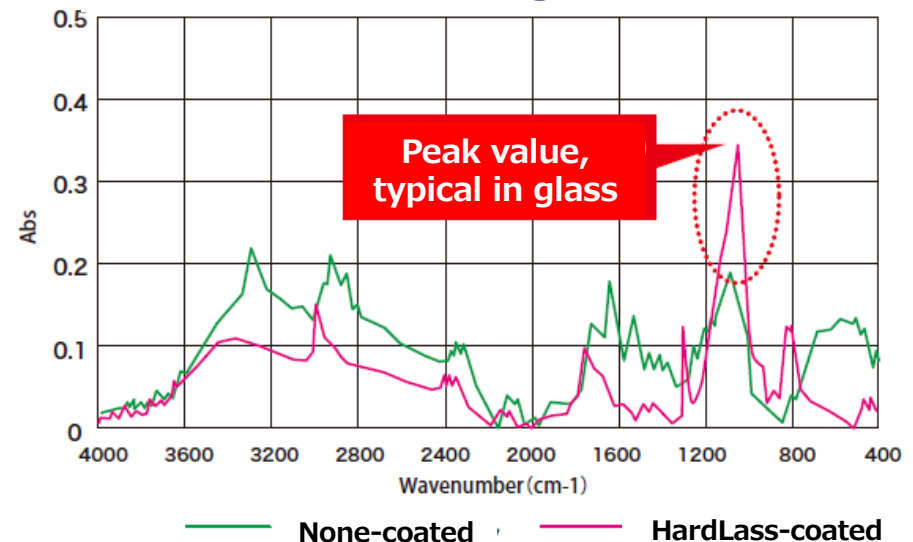


Water drop sinking in material with no coating compared to the coated one still able to repel it.



Water spreading angle is shallower in none-coated compared to the coated clearly repelling.

Strong evidence as peak value typical in glass-alike material measured even after the weathering test.



<Test Method>

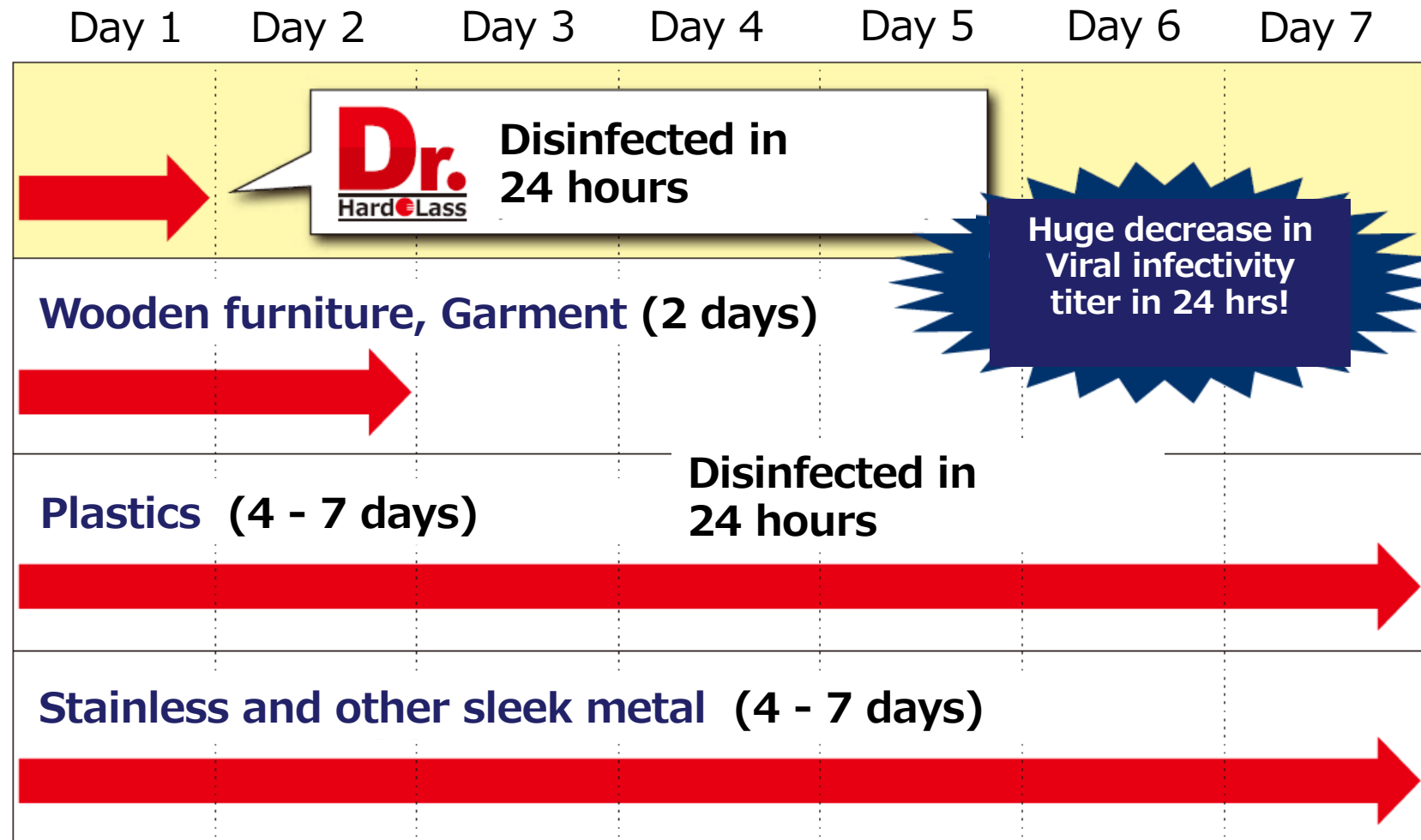
Accelerated weathering test with metal halide lamp

<Testing machine>

Metering weather meter M6T



Life time of typical viruses



Comparison with other products

	Anti-virus	Anti-bacteria	Anti-dirt	Anti-scratch	visibility	Life time	Safety	Remarks
Dr. HardoLass	⊙	⊙	⊙	⊙	⊙	⊙	⊙	Only Dr. HardoLass have antiviral & antibacterial agents
Photocatalyst	○	○	×	×	⊙	○	⊙	Requires lighting, weak adhesion
Hypochlorous acid	△	⊙	×	×	⊙	×	×	Strong stimulant
Ozone	⊙	⊙	×	×	⊙	×	×	Harmful to humans
Hydrogen peroxide	×	⊙	×	×	⊙	△	△	Difficult to handle outside of the industrial field
Ion	⊙	⊙	×	×	⊙	⊙	⊙	Short-lived
Film type	⊙	⊙	×	⊙	×	⊙	⊙	Unattractive, easily peeled off

導入実績（一部抜粋）

NTT
docomo

SHARP

 三菱地所株式会社

 **コニシ株式会社**



JFE

 トヨタホーム

 **MITSUBISHI
ELECTRIC**

ThreeBond

 東急コミュニティー

KOKUYO

古河電工

JR
JR西日本

Coca-Cola

GOLF5

Yashima
Next to your future

K[!]SEI
GROUP

Asahi
アサヒ飲料

NIKI GOLF

 **YAMADA**

 湘南モノレール

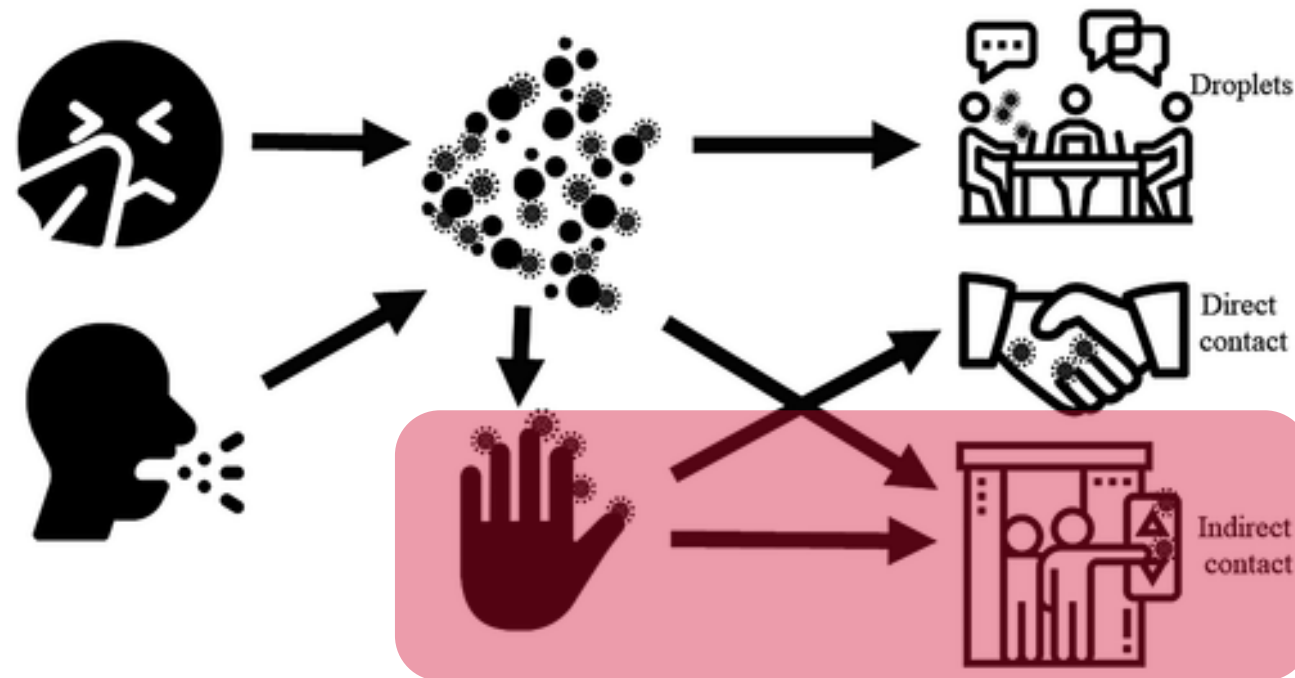
DyDo

**THE SUPER
SPORTS XEBIO**

Proposal

Our value proposing

We save people from direct contact infection



Our covering segment

Recommending Area

Heavy Duty Area, many direct touches



Thank you

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