CASE STUDY

Clarus Healthboards Shine in Scientific Bacteria Test

clarus

EXECUTIVE SUMMARY

Healthcare settings require non-porous, sanitary fixtures, furniture, and surfaces for infection control. Clarus commissioned a scientific experiment based on the hypothesis that the non-porous nature of Clarus glass would outperform traditional whiteboards from a bacteria-resistant and sanitation perspective. After a thorough head-to-head experiment, the Clarus glassboard soundly outperformed the whiteboard, with the results proving the whiteboard to be three times dirtier. In addition, the more bacteria-resistant glassboard sanitized from a level 6,000 times above standard sanitary levels of pathogens to food-grade safe with the use of an ammonia-based cleaner.

Did you know that according to the Centers for Disease Control and Prevention (CDC), one out of every three people have the infamous 'staph' on their skin or nose? Staph and other bacteria contribute to the contamination of healthcare facilities around the world, creating challenges in their design and operation. The CDC also cites over 1.7 million Healthcare Acquired Infections (HAI) each year causing or contributing to 99,000 deaths. With patients under care vulnerable to infection, healthcare facilities take extra measures to prevent the spread of pathogens. Among traditional best practices, such as hand-washing, evidence-based architectural design is a proven method for reducing HAI.

In patient rooms, horizontal and vertical surface materials are a major factor in the effectiveness of the environment's bacteria resistant characteristics. Furniture and fixtures are being designed without seams and must stand up to intense cleaning. Naturally, a non-porous surface is ideal. The National Institutes of Health (NIH) further identifies "high-touch surfaces" and "high-touch objects," which can be a magnet for the aforementioned consequences. Healthcare architects identify surfaces, doorknobs, sinks, floors, and even call-buttons as well-documented considerations when designing for infection control. However, writing surfaces, often in the form of porous whiteboards, may present undue and underestimated risk for the spread of infection. With the porosity of traditional melamine and plastic whiteboards as a concern, Clarus commissioned an independent scientific experiment to test the surface performance of Clarus glass versus traditional whiteboards.

The experiment was performed by Dr. Sam Holmstrom, a pathologist with clinical experience in measuring and analyzing bacteria at the molecular level. Dr. Holmstrom's career in research has spanned from the University of Michigan Medical School to University of Texas Southwestern Medical Center to Columbia University Medical Center. With both test and control whiteboards and Clarus Healthboard glass, Dr. Holmstrom emphasized the unpredictability of such experiments as his work commenced:

> "While we hypothesize that less porosity in glass contributes to lower pathogen counts, science is unpredictable, and only after testing the materials can we better predict the performance of these materials."
>
> — Sam Holmstrom, Ph. D.

The experiment began with an evaluation of the 'base-levels' of pathogens on the surfaces of the Healthboard glass and traditional whiteboard material.

Next, both surfaces were exposed to highly-concentrated levels of pathogens, which were incubated over several days to further expose the materials to live cultures in advance of measuring, and ultimately attempting to sanitize the boards.

A first attempt to clean and sanitize the surfaces took place with EXPO Whiteboard Cleaner, a traditional, if non-healthcare grade solution. Both surfaces were then cleaned with ammoniated cleaner, followed by a final bacteria test. With the pathogen levels being tested by the highly accurate novaLUM Detection system, the results at each stage of the experiment would provide conclusive evidence regarding the surface characteristics of both the whiteboard and Healthboard glass relative to the harboring of bacteria. NovaLUM achieves the measurement by detecting adenosine triphosphate (ATP), present only in living organisms and an indicator of the counts and size of live bacteria colonies.

THE EXPERIMENT

PHASE 1: BASE LEVELS

Upon initial experiment, it was found that the Healthboard glass material shipped 'below' the standard sanitary cutoff for surface materials of 2500 RLU on the 4-inch by 4-inch area tested. The traditional whiteboard surface exceeded standard sanitary levels. Factors for base-level pathogens include the introduction of bacteria in the manufacturing or shipping process. NovaLUM achieves the measurement by detecting adenosine triphosphate (ATP), present only in living organisms and an indicator of the counts and size of live bacteria colonies.

PHASE 2: CONTAMINATION & SANITATION

Next, both surfaces were exposed to extremely high levels of pathogens which had been cultured and incubated over a period of several days to ensure maximum surface contamination. In fact, Clarus was exposed to double the contamination level, arriving at a soiled state of 6,000 times the sanitary cutoff to the whiteboard's 3,000 times state. This put the Clarus glass at a disadvantage upon sanitation with many times the live bacteria colonies introduced to the surface.

Knowing the ammonia-based cleaning to follow would have a lethal effect on much of the bacteria, an intermediary step was added to determine the effects of attempting to sanitize the surfaces using EXPO Whiteboard cleaner.

The whiteboard cleaner dramatically reduced the level of pathogens on both boards but did not yield sanitary levels for either surfaces, therefore indicating that healthcare practitioners and facility managers should look to stronger cleaners, no matter the material, for the sanitation of high-touch writing surfaces.

With both the traditional whiteboard and the Healthboard's glass surface still contaminated with highly-concentrated levels of pathogens, an ammonia-based cleaning solution was introduced to determine the practicality of writing-surface sanitation in a healthcare setting.

While Dr. Holmstrom hypothesized that the limited porosity in Clarus glass would allow the solution to kill more bacteria than with traditional whiteboards, this would be the test. In essence, the central question becomes "Which surface cleans better?" An essential concern with the goal of preventing HAI.

THE RESULTS

Dr. Holmstrom chose an ammonia-based cleaner as a more harsh solution to the isopropanol mixtures found in products such as Cavi Wipes. Glass has no adverse effect through the use of ammonia, while plastic materials may degrade after use. This itself presents more intense cleaning options for glass surfaces versus plastic surfaces.

After utilizing the ammonia-based cleaner, Dr. Holmstrom, once again measuring with the novaLUM luminometer, saw immediate improvement in bacteria levels.

WHITEBOARD

PART 1

First, Dr. Holmstrom measured the surface of the traditional whiteboard.

PART 2

Initially contaminated to only half the levels of the glass, the whiteboard still, after ammonia-based cleaning, demonstrated contamination 290% in excess of standard sanitation levels. The whiteboard, despite cleaning, was still harboring dangerous pathogens, unfit for a healthcare environment.

CLARUS GLASSBOARD

PART 1

Next, Dr. Holmstrom measured Clarus' Healthboard which had previously been doused with bacteria, to levels exceeding 6000 times the sanitary cutoff, ensuring that the glass was at an ample disadvantage in anticipation of strenuously testing the hypothesis of better performance.

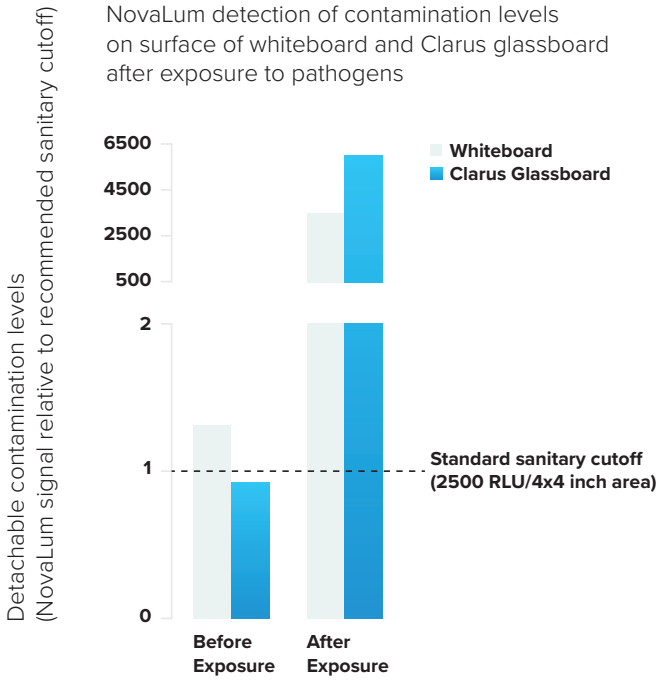
PART 2

After measurement, the Healthboard was successfully sanitized, below standard sanitary cutoffs, meaning the surface that had been intensely contaminated was now food-grade safe. While the traditional whiteboard clearly protected bacteria, harboring it with its porosity, the glass provided no shelter to pathogens, exposing them to the ammoniated cleaner and delivering a surface fit for any healthcare environment.

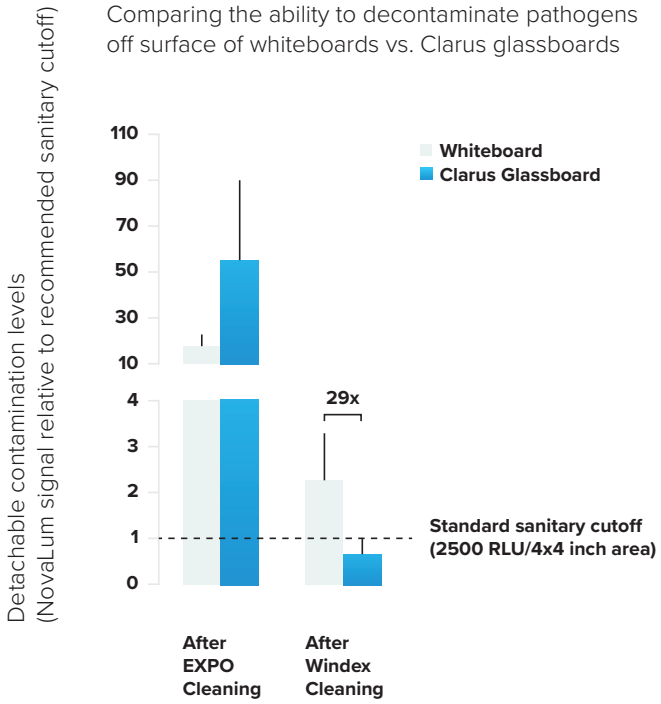
AFTER MEASUREMENT, THE HEALTHBOARD WAS SUCCESSFULLY SANITIZED... IT WAS NOW FOOD-GRADE SAFE.

The healthboard contained three times less bacteria than the traditional whiteboard.

NovaLum detection of contamination levels on surface of whiteboard and Clarus glassboard after exposure to pathogens



Comparing the ability to decontaminate pathogens off surface of whiteboards vs. Clarus glassboards



> Both boards sanitized more efficiently with ammoniated cleaner than with the traditional 'whiteboard cleaner'. But after the ammoniated cleaner, the Healthboard was officially sanitary, while the whiteboard failed to achieve sanitary levels. This suggests that the traditional whiteboard may be unsafe in healthcare settings, especially where perfect cleaning techniques are lacking."
>
> — Sam Holmstrom, Ph. D.

ABOUT DR. SAM HOLMSTROM

Dr. Sam Holmstrom received his Ph.D. in Pharmacology from University of Michigan in 2005 and has worked in variety of fields within biology. After studying molecular actions of cortisone, he continued as a research associate at the Howard Hughes Medical Institute at UT Southwestern Medical Center. There he investigated lipid metabolism and pancreas physiology under a federal grant before heading to Columbia University to study pancreatic cancer for three years. Currently, he is back at UT Southwestern innovating rapid genetic screening methods to identify novel cancer-causing mutations.