# TECHNICAL BULLETIN

# PURELL® Healthcare Surface Disinfectant

**Product Description:**

U.S. Environmental Protection Agency (EPA) registered, PURELL Healthcare Surface Disinfectant is a one-step sanitizer / disinfectant and cleaner designed to kill the most relevant pathogens at work, schools, daycare, and gyms. The 29.4% ethyl alcohol-based formula is effective against 48 microorganisms, with efficacy against 37 of those organisms in 30 seconds. Ideal for disinfecting hard, non-porous surfaces, sanitizing food-contact, no-rinse hard nonporous surfaces, and sanitizing soft surfaces.

*Please read product label for usage instructions.*

| Physical Properties | |
|---|---|
| **Appearance** | Colorless |
| **Fragrance** | Citrus |
| **Form** | Liquid |

| Active Ingredient |
|---|
| Ethyl Alcohol, 29.4% w/w (CAS: 64-17-5) |

| EPA Registration Number |
|---|
| 84368-1-84150 |

March 24, 2021

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## Efficacy Testing – Timed, Exposure Kill Evaluation

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|---|---|
| **Objective** | Evaluate the antimicrobial effectiveness of the product *in vitro.* |
| **Description of Tests** | Testing was conducted in accordance with the U.S. Environmental Protection Agency guidelines in effect at the time for determining efficacy of sanitizers / disinfectants intended for use on dry inanimate surfaces. |
| **Independent Laboratories** | • MicroBioTest, A Division of Microbac Laboratories, Sterling, VA 20164<br>• Microchem Laboratory, Inc., Euless, TX 76040<br>• Accuratus Lab Services, Eagan, MN 55121 |

## Test Results

***Test Organisms Reference List***

***Hard, Nonporous Surface Disinfection Pathogens***

| **Bacteria** | **Strain / ATCC No.** | **Contact Time** |
|---|---|---|
| *Acinetobacter baumannii* | ATCC 19606 | 30 seconds |
| *Acinetobacter baumannii* Multi-drug resistant (MDR) | ATCC 19606 | 30 seconds |
| *Bordetella pertussis* | ATCC 12743 | 30 seconds |
| *Campylobacter jejuni* | ATCC 43451 | 30 seconds |
| *Escherichia coli* (E. coli) | ATCC 11229 | 30 seconds |
| *Enterobacter aerogenes* | ATCC 13048 | 30 seconds |
| *Enterococcus faecium* | ATCC 51559 | 30 seconds |
| *Klebsiella pneumoniae* | ATCC 4352 | 30 seconds |
| *Klebsiella pneumoniae* Carbapenem Resistant (CRE) | BAA-1705 | 30 seconds |
| *Listeria monocytogenes* (Listeria) | ATCC 49594 | 30 seconds |
| Methicillin-resistant *Staphylococcus aureus* (MRSA) | ATCC 33591 | 30 seconds |
| *Pseudomonas aeruginosa* | ATCC 15442 | 1 minute |
| *Salmonella enterica* (Salmonella) | ATCC 10708 | 30 seconds |
| *Staphylococcus aureus* (Staph) | ATCC 6538 | 1 minute |
| *Streptococcus pneumoniae* (Strep) | ATCC 6305 | 30 seconds |
| *Streptococcus pyogenes* (Strep) | ATCC 12344 | 30 seconds |
| Vancomycin Resistant *Enterococcus faecalis* (VRE) | ATCC 51575 | 30 seconds |
| *Vibrio vulnificus* | ATCC 27562 | 30 seconds |
| *Yersinia enterocolitica* | ATCC 9610 | 30 seconds |
| *Staphylococcus aureus* (use dilution) | ATCC 6538 | 5 minutes |
| *Pseudomonas aeruginosa* (use dilution) | ATCC 15442 | 4 minutes |
| **Mold, Mildew & Fungi** | | |
| *Aspergillus niger* (Mold) | ATCC 6275 | 5 minutes |
| *Candida albicans* | ATCC 10231 | 30 seconds |
| *Trichophyton mentagrophytes* | ATCC 9533 | 30 seconds |
| **Mycobacterium** | | |
| *Mycobacterium bovis* var. BCG (TB) | N/A | 5 minutes |
| **Viruses Enveloped** | | |
| 2009-H1N1 Influenza A Virus (H1N1) | A/California/04/09 | 30 seconds |
| Influenza A virus (Flu Virus) | A/California/04/09 | 30 seconds |
| Avian Influenza H7N9 | Strain wildtype A/Anhui/1/2013, CDC #2013759189 | 25 seconds |


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| *Test Organisms Reference List (Cont.)* | | |
|---|---|---|
| ***Hard, Nonporous Surface Disinfection Pathogens*** | | |
| **Viruses Enveloped** | **Strain / ATCC No.** | **Contact Time** |
| Avian Influenza H5N1 | Strain VNH5N1-PR8/CDC-RG, CDC #2006719965 | 15 seconds |
| Herpes simplex virus type 1 | ATCC VR-733, Strain F(1) | 30 seconds |
| Human Coronavirus, Strain 229E | ATCC VR-740 | 30 seconds |
| SARS-CoV-2 (COVID-19) | USA-WA1/2020 | 30 seconds |
| Measles | ATCC VR-24, Strain Edmonston | 30 seconds |
| Mumps | ATCC VR-1438, Strain Jones | 30 seconds |
| **Viruses Non-Enveloped** | | |
| Canine Parvovirus (Parvo) | ATCC VR-2017 | 30 seconds |
| Coxackie virus type B3 (a cause of Hand Foot & Mouth disease) | ATCC VR-30, Strain Nancy | 30 seconds |
| Enterovirus type D68 (a cause of Hand, Foot & Mouth disease) | ATCC VR-1825, Strain US/KY/14-18953 | 30 seconds |
| Murine norovirus (Norovirus) | MNV-G, Yale University | 30 seconds |
| Feline Calicivirus (as surrogate for Norovirus) | ATCC VR-782 | 30 seconds |
| Polio Type 1 virus | ATCC VR-1562 | 30 seconds |
| Respiratory syncytial virus (RSV) | ATCC VR-26 | 30 seconds |
| Rhinovirus (a cause of the common cold) | ATCC VR-284 | 30 seconds |
| Rotavirus | ATCC VR-2018 | 30 seconds |
| **Bloodborne Pathogens** | | |
| Human Hepatitis B virus (HBV) | Grimaud | 30 seconds |
| Human Hepatitis C virus (HCV) | NADL | 30 seconds |
| Human immunodeficiency virus Type I (HIV-1) | Strain IIB (B) | 30 seconds |

| ***Food Contact Surface Sanitization Pathogens*** | | |
|---|---|---|
| **Bacteria** | **Strain / ATCC No.** | **Contact Time** |
| *Campylobacter jejuni* | ATCC 29428 | 1 minute |
| *Clostridium perfringens* | ATCC 13124 | 1 minute |
| *Cronobacter sakazakii* | ATCC 29544 | 1 minute |
| *Escherichia coli* (E. coli) | ATCC 11229 | 1 minute |
| *Staphylococcus aureus* (Staph) | ATCC 6538 | 1 minute |
| *Escherichia coli* O157:H7 (STEC Shiga toxin-producing) | ATCC 35150 | 1 minute |
| *Listeria monocytogenes* (Listeria) | ATCC 19117 | 1 minute |
| *Salmonella typhimurium* (Salmonella typhi) | ATCC 14028 | 1 minute |
| *Shigella dysenteriae* (Shigella) | ATCC 11835 | 1 minute |
| ***Non-Food Contact Surface Sanitization Pathogens*** | | |
| **Bacteria** | | |
| *Enterobacter aerogenes* (liquid application) | ATCC 13048 | 10 seconds |
| *Klebsiella pneumoniae* | ATCC 4352 | 10 seconds |
| *Staphylococcus aureus* (Staph) | ATCC 6538 | 10 seconds |
| ***Soft Surface Sanitization Pathogens*** | | |
| **Bacteria** | | |
| *Klebsiella pneumoniae* | ATCC 4352 | 30 seconds |
| *Staphylococcus aureus* (Staph) | ATCC 6538 | 30 seconds |


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| Safety and Toxicity Testing | |
|---|---|
| **Objective** | Evaluate the acute safety and toxicity of product formulation *in vivo*. |
| **Description of Tests** | Testing was conducted in accordance with the U.S. Environmental Protection Agency guidelines in effect at the time for determining acute toxicity of sanitizers / disinfectants intended for use on dry inanimate surfaces. |
| **Independent Laboratories** | Stillmeadow, Inc., 12852 Park One Drive, Sugar Land, TX 77478 |
| **Test Results** | |
| **Acute Oral Toxicity*** | Meets EPA requirement for Category IV rating (greater than 5000 mg/kg). |
| **Acute Dermal Toxicity*** | Meets EPA requirement for Category IV rating (greater than 5000 mg/kg). |
| **Acute Inhalation Toxicity*** | Meets EPA requirement for Category IV rating (greater than 2 mg/liter). |
| **Acute Eye Irritation** | EPA Testing Guideline: OCSPP 870.2400<br>Meets EPA requirement for Category IV rating (minimal effects clearing in less than 24 hours). Under the conditions of the test, the product did not produce eye irritation. |
| **Acute Dermal Irritation** | EPA Testing Guideline: OCSPP 870.2500<br>Meets EPA requirement for Category IV rating. Under the conditions of the test, the product did not produce skin irritation. |
| **Skin Sensitization*** | Meets EPA requirements as a non-sensitizer for Category IV rating. |
| * The ingredients in this product are generally regarded as safe (GRAS) and toxicity testing was not required for registration of this product. | |

| Product Stability Testing | |
|---|---|
| **Objective** | Determine if the product meets the performance requirements over the desired four-year product shelf life. |
| **Description of Tests** | Stability Study to measure the properties of product over time (on shelf, unopened, opened). Using standardized test methods defined by the EPA and other international standards, testing was completed under accelerated (54°C) for 4 weeks and real time (25°C) conditions for up to four years. |
| **Test Conclusions** | |
| This product has met the requirements necessary to show that the product is stable for a minimum of four years of shelf life if stored in accordance with label instructions. | |


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## Surface Compatibility Testing

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| **Objective** | Determine product compatibility with common surfaces after extended and repeat contact exposures. |
| **Description of Tests** | • Compatibility studies measure the effects of product on the properties of common surfaces. Using a standardized test methodology, many different hard and soft surface materials were exposed to the product under a worst-case simulated use condition, equivalent to approximately one year of extreme use. Where applicable, test materials were soaked in PURELL Surface Disinfectant and other commercially available surface sanitizers / disinfectants for comparison for up to 12 cycles in "use dilution".1 cycle = 20 hrs. static soak followed by 2-4 hr. air dry at room temperature<br>• 12 cycles simulate ~1300 to 1500 exposures or one year (3-4x day) with a 10-minute contact time<br><br>For handheld electronics, the device was directly sprayed and allowed to stand for 5 minutes before wiping. This test was repeated 50 times. |

## Test Conclusions

- Testing has demonstrated this product is compatible with many common hard and soft surface materials, including:

| Category | Material |
|---|---|
| Metals | Stainless Steel 316, Stainless Steel A2 and Brushed Bronze |
| Plastics | PVC Type 1, PET, HDPE, Vinyl Tile, Acrylic and Polycarbonate |
| Rubber | EPDM and Natural |
| Ceramic | Porcelain Tile |
| Soft Surfaces | *Cotton, Polyester, Polyamide, and Nylon blended fabrics, Urethane Foam, High Density Foam, EVA Foam, and various Vinyl Fabrics |
| Natural Stone | Sealed granite, **Quartz (polished and unpolished) |
| Exercise Equipment | Life Fitness Cross Trainer 95X with LCD console |
| Handheld Electronics | LG (V30), Google (Pixel 2), Apple (iPhone 8), Samsung (Galaxy S8, Galaxy Note8), ***Motorola (Moto Z2), Microsoft (Surface 3) |

**Some dyes may bleed color ** May cause slight color change on unpolished quartz ***Some cosmetic discoloration with no loss of functionality*

| | |
|---|---|
| **Recommendations** | • For best results, always test in a small inconspicuous area before broad application.<br>• Wood and metal surfaces coated with alcohol soluble finishes, such as varnish, shellac, linseed oil and some powder coatings should be avoided. *Note: Wax or modern polyurethane finishes are <u>not</u> alcohol soluble and do not present incompatibility concerns.*<br>• Not recommended for repeat use on marble, untreated copper, brass, and aluminum surfaces.<br>• Spray handheld devices (cellphones/tablets) lightly and avoid open ports. Verify compatibility with other manufacturers and models.<br>• Not recommended for use on natural leather surfaces. *Note: Synthetic vinyl fabrics, such as Naugahyde® have shown no incompatibility issues during testing.* |


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| Cleaning Capability Testing | |
|---|---|
| **Objective** | Evaluate cleaning performance compared to leading cleaning, sanitizing and disinfecting products found in professional and retail markets. |
| **Description of Tests** | Cleaning Study to measure the effectiveness of soil and organic matter removal from common surfaces. Standardized test methodology used to provide numerical evaluation (0 to 100) of a product's capability in removing/cleaning five difficult soils from common surfaces.<br><br>Data compared cleaning capability of products on five difficult soils (blood, coke, ketchup, salad dressing, and syrup) applied to four common surfaces (ABS plastic, Formica, stainless steel, vinyl composite). Data was generated for this product in addition to six leading competitive products. |
| **Independent Laboratories** | Sterling Laboratories, Toledo, Ohio (Study Nbr. 14261FM29) |

## Test Conclusions

All products had statistically equivalent cleaning performance for the respective soil and surface combinations.

| Allergen Removal Testing | |
|---|---|
| **Objective** | Evaluate removal of allergen proteins from textured HDPE and stainless-steel surfaces. |
| **Description of Tests** | Creamy peanut butter (0.5 g) was spread onto a 3"x3" surface area on a textured HDPE or stainless-steel surface. One spray of product was applied to the surface and wiped for 5 strokes with a Chicopee towel wipe. Untreated, treated, and water treated surfaces were swabbed and evaluated for protein allergens by ELISA. |

## Test Results

On a stainless-steel surface, treatment with PURELL Healthcare Surface Disinfectant significantly reduced the peanut allergen protein. On a textured HDPE surface, treatment with the Healthcare Surface Disinfectant significantly reduced the peanut allergen protein.

## Test Conclusions

Healthcare Surface Disinfectant when used according to the label instructions, can be used as part of an allergen management program to help remove soil containing food allergen proteins from hard, non-porous surfaces. However, a customer is responsible for any validation and verification of their food safety plan and allergen management program.


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