TECHNICAL BULLETIN

PURELL® PROFESSIONAL SURFACE DISINFECTING WIPES

Product Description:

U.S. Environmental Protection Agency (EPA) registered, PURELL® Professional Surface Disinfecting Wipes is a ready-to-use, no-rinse food-contact surface sanitizing and disinfecting wipe designed to kill the most relevant pathogens at work, schools, daycare centers and gyms. The 20.0% ethyl alcohol-based formula is effective against 29 microorganisms, with efficacy against 25 of those organisms in 1 minute or less. Ideal for disinfecting hard, non-porous surfaces.

Please read product label for usage instructions.

Physical Properties	
Appearance	Clear to cloudy liquid; may have slight precipitate
Fragrance	Fresh citrus
Form	Liquid in towelette

Active Ingredient	
Ethyl Alcohol 20.0% w/w	CAS:64-17-5

EPA Registration Number
84150-1

Efficacy Testing – Timed, Exposure Kill Evaluation

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 disinfectants intended for use on dry inanimate surfaces.
Independent Laboratories	• MicroBioTest, A Division of Microbac Laboratories, Sterling, VA 20164 • Microchem Laboratory, Inc., Euless, TX 76040 • Accuratus Lab Services, Eagan, MN 55121

Test Results

Hard, Non-Porous Surface Disinfection Pathogens		
Bacteria	**Strain / ATCC No.**	**Contact Time**
Acinetobacter baumannii (multi-drug resistant, MDR)	ATCC 19606	60 seconds
Bordetella pertussis	ATCC 12743	60 seconds
Campylobacter jejuni	ATCC 29428	60 seconds
Enterobacter aerogenes	ATCC 13048	75 seconds
Escherichia coli O157:H7 (*E. coli,* STEC, Shiga toxin-producing *E. coli)*	ATCC 35150	60 seconds
Escherichia coli (Carbapenem Resistant) (CRE)	CDC 81371	60 seconds
Klebsiella pneumoniae Multi-drug Resistant (MDR)	ATCC 51503	60 seconds
Listeria monocytogenes (*Listeria)*	ATCC 19117	60 seconds
Methicillin-resistant *Staphylococcus aureus* (MRSA)	ATCC 33592	90 seconds
Pseudomonas aeruginosa (Pseudomonas)	ATCC 15442	60 seconds
Salmonella enterica (*Salmonella)*	ATCC 10708	60 seconds
Salmonella enterica enterica, serovar typhi (Typhi, *Salmonella* typhi)	ATCC 6539	60 seconds
Shigella flexneri	ATCC 9380	60 seconds
Staphylococcus aureus (Staph)	ATCC 6538	110 seconds
Streptococcus pneumoniae Penicillin Resistant (Drug Resistant)	ATCC 700677	60 seconds
Streptococcus pyogenes (Strep)	ATCC 19615	60 seconds
Vancomycin Resistant *Enterococcus faecalis* (VRE)	ATCC 51575	60 seconds
Vancomycin Intermediate Resistant *Staphylococcus aureus* (VISA)	CDC HIP 5836	80 seconds
Viruses Enveloped		
Avian Influenza (H5N1)	Strain VNH5N1 -PR8/CDC-RG, CDC #2006719965	15 seconds
Avian Influenza (H7N9)	Strain wildtype A/Anhui/1/2013, CDC # 2013759189	15 seconds
Herpes simplex 1	Strain F(1), ATCC VR-733	15 seconds
Herpes simplex 2	Strain G, ATCC VR-734	15 seconds
Influenza A virus (H1N1, Flu virus)	A/PR/8/34	15 seconds
Influenza B virus	Strain B/Hong Kong/5/72, ATCC VR-823	15 seconds
Mumps virus	Strain Jones, ATCC VR-1438	25 seconds
Parainfluenza	Type 3, Strain C243, ATCC VR-93	15 seconds
SARS-CoV-2 virus (COVID-19 Virus)	USA-WA1/2020	30 seconds
Respiratory syncytial virus (RSV), Strain Long (a cause of the common cold)	ATCC VR-26	15 seconds
Human Coronavirus, Strain 229E (a cause of the common cold)	ATCC VR-740	15 seconds

Hard, Non-Porous Surface Disinfection Pathogens (continued)		
Viruses Non-Enveloped		
Feline Calicivirus (as surrogate for human norovirus, Norwalk-like virus, norovirus))	ATCC VR-782	5 minutes
Murine norovirus	Strain MNV-G, Yale University	120 seconds
Rhinovirus type 37 (a cause of the common cold)	Strain 151-1, ATCC VR-1147	60 seconds
Rotavirus	Strain WA, ATCC VR-2018	30 seconds
Bloodborne Pathogens		
Human hepatitis B virus (HBV)	9/1/15 Strain, Hepadnavirus Testing Inc	20 seconds
Human hepatitis C virus (HCV)	NADL strain, ATCC VR-1422	20 seconds
Human immunodeficiency virus Type I (HIV-1)	Strain HTLV-III_B, Advanced Biotechnologies	15 seconds
Food-Contact Surface Sanitization Pathogens		
Bacteria		
Escherichia coli (*E. coli)*	ATCC 11229	60 seconds
Staphylococcus aureus (Staph)	ATCC 6538	60 seconds
Non-Food-Contact Surface Sanitization Pathogens		
Bacteria		
Klebsiella pneumoniae	ATCC 4352	10 seconds
Staphylococcus aureus (Staph)	ATCC 6538	10 seconds

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 disinfectants intended for use on dry inanimate hard surfaces.
Independent Laboratories	Stillmeadow, Inc., 12852 Park One Drive, Sugar Land, TX 77478
Test Results	
Acute Oral Toxicity	EPA Testing Guideline: OCSPP 870.1100 The test substance acute oral LD_{50} was determined to be greater than 5000 mg/kg which meets the EPA toxicity requirement for Category IV rating.
Acute Dermal Toxicity*	EPA Testing Guideline: OCSPP 870.1200 Meets EPA requirement for Category IV rating (greater than 5000 mg/kg).
Acute Inhalation Toxicity	EPA Testing Guideline: OCSPP 870.1300 The test substance acute inhalation LC_{50} is greater than 2.22 mg/L which meets the EPA toxicity requirement for Category IV rating.
Acute Eye Irritation	EPA Testing Guideline: OCSPP 870.2400 Under the conditions of the test, the product is rated minimally irritating with effects clearing in less than 24 hours and meets the EPA requirement for Category IV rating.
Acute Dermal Irritation	EPA Testing Guideline: OCSPP 870.2500 Under the conditions of the test, dermal irritation was not observed which meets EPA requirement for Category IV rating.
Skin Sensitization	EPA Testing Guideline: OCSPP 870.2600 Under the conditions of the test, the product meets EPA requirements as a non-sensitizer for Category IV rating.

* A data waiver for Acute Dermal Toxicity was requested and accepted for this registration formulation based on the *"US Environmental Protection Agency Office of Pesticide Programs, Guidance for Waiving Acute Dermal Toxicity Tests for Pesticide Formulations & Supporting Retrospective Analysis,"* issued November 9, 2016. Dermal toxicity testing was not required for registration of this product.

Surface Compatibility Testing

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® Professional Surface Disinfecting Wipes Solution and other commercially available surface disinfecting and sanitizing wipes 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 • 12 cycles simulate ~1300 to 1500 exposures or one year (3-4x day) with a 10-minute contact time

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	**Quartz (polished and unpolished)
Handheld Electronics	LG (V30), Kyocera (DuraForce PRO), Google (Pixel 2), Apple (iPhone 8), Samsung (Galaxy S8, Galaxy Note8), Microsoft (Surface 3), ELO (touchscreen monitor E045337), Varifone (credit card machine), ASUS (touchscreen monitor VT168), Angel POS (Touchscreen Point of sales 1006015).

**Some dyes may bleed color ** May cause slight color change on unpolished quartz*

Recommendations	• For best results, always test in a small inconspicuous area before broad application and assess for damage prior to use • 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.* • Not recommended for repeat use on marble, untreated copper, brass, and aluminum surfaces. • PURELL Surface Wipes while compatible with many common hard, nonporous surfaces, are not known to sanitize/disinfect soft surfaces • Not recommended for use on natural leather surfaces. *Note: Synthetic vinyl fabrics such as Naugahyde® have shown no incompatibility issues during testing.*

	• On some surfaces, a residue may become visible after repeat use. If this occurs, please rewet the surface with a PURELL® Surface Wipe and follow immediately with a clean dry cloth, paper towel, or dry wiper.

Cleaning Capability and Streaking Performance Testing	
Objective	Evaluate cleaning and streaking 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. Data compared cleaning capability of products on five difficult soils (blood, soda, ketchup, salad dressing, and syrup) applied to four common surfaces (ABS plastic, stainless steel, vinyl tile, white countertop). Data was generated for this product in addition to five leading competitive products.
Independent Laboratories	Sterling Laboratories, Toledo, Ohio (Study Nbr. 18157GH22)

Test Conclusions

In third-party lab testing, PURELL® Surface Wipes showed comparable cleaning performance to many market leading one-step sanitizing/disinfecting wipes. PURELL® Surface Wipes showed the least amount of streaking in comparison to leading competitive disinfecting/sanitizing wipes.

Product Stability Testing	
Objective	Determine if the product meets the performance requirements over the desired three-year product shelf life.
Description of Tests	Stability Study to measure the properties of product over time (unopened). Using standardized test methods defined by the EPA and other international standards, testing was conducted at room temperature (25°C) conditions and determined to be stable for a minimum of 3 years.

Test Conclusions

This product has met the requirements necessary to show that the product is stable for a minimum of three years of shelf life if stored in accordance with label instructions.

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. The surface was wiped for 5 strokes with a PURELL® Surface Wipe, folding the wipe so a new surface is exposed with each stroke. 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® Surface Wipes significantly reduced the peanut allergen protein. On a textured HDPE surface, treatment with the PURELL® Surface Wipes significantly reduced the peanut allergen protein.

Test Conclusions

PURELL® Surface Wipes 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.

