



CAN YOU HELP CONTROL E-COLI, SALMONELLA, AND MRSA BY JUST CHANGING YOUR LIGHT BULBS?

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"BACTERIAL SURVIVAL ON GLASS AND LAMINATED WOOD SURFACES EXPOSED TO PURE-LIGHT COATED LED LIGHT BULBS"

PLT has taken NASA inspired technology, improved on it, made it affordable and usable in open public settings.

The attached lab study by the Nation's Leading Environmental Testing firm, EMSL ANALYTICAL, demonstrates that by just using the Pure-Light Super-Oxygen LED light bulbs, E-COLI, SALMONELLA, AND MRSA can be substantially controlled and even eliminated. *(Additional studies can be obtained by request.)*

The slides and wood flooring samples were exposed to PURE-LIGHT coated LED light bulbs at intervals of 5 feet and 8 feet from the lights and tested at 24 and 72-hour intervals to determine organism survival/reduction. Conclusion: "...*E. coli* was reduced by 94.7% on glass and 93.3% on the wood surface after 72 hours of treatment. MRSA was reduced by 80.6% and 80.0% on glass and wood after 72 hours"

- The NASA technology behind the Pure-Light Super-Oxygen Light™ bulbs has been shown to breakdown 99.9% of bacteria, viruses, fungi, mold including deadly MRSA, Cold & Flu viruses, E-COLI, SARS, STAPH, CRE, Salmonella, Anthrax, Plague... even those viruses/bacteria that have become resistant to antibiotics.
- Additionally, the process breaks down toxic indoor air pollutants like formaldehyde, carbon monoxide, methane, benzene and other VOCs into harmless components. *(The main components of deadly "Smog")*
- **ANTI-ALLERGEN** The process also dissolves pollen and other allergens helping to make your building more hypo-allergenic.
- **ELIMINATES ODORS** without masking them with fragrances such as tobacco smoke, cigar smoke, pet odors...even can help get rid of skunk odor.
- Eradicates need for harmful chemical sanitizers
- Pure-Light is good for plants, demonstrating an ability to accelerate their growth while controlling fungus and mildew.

FINAL REPORT

Bacterial Survival on Glass and Laminated Wood Surfaces Exposed to  
PURELIGHT Coated LED Light Bulbs

Order Number: 371725740

PREPARED FOR:

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Michael A. Spears 2/8/2018

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## CERTIFICATE OF ANALYSIS

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CLIENT: PURE-LIGHT TECHNOLOGIES, LLC.

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PROJECT: BACTERIAL SURVIVAL ON GLASS AND LAMINATED WOOD  
SURFACES EXPOSED TO PURE-LIGHT COATED LED LIGHT BULBS

PRODUCT: COATED LED LIGHT BULBS

SAMPLE RECEIVED: 11/2017

REPORT DATE: 2/7/2018 CHALLENGE

BACTERIA:

- ESCHERICHIA COLI 25922
- SALMONELLA ENTERICA 14028
- METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS 43300

### I. EXPERIMENTAL SUMMARY

Glass slide and laminated wood flooring coupons were inoculated in triplicate with a suspension of Escherichia coli, Salmonella enterica, and methicillin-resistant Staphylococcus aureus (MRSA). The slides and wood flooring samples were exposed to PURE-LIGHT coated LED light bulbs and tested at 24 and 72-hour intervals to determine organism survival/reduction. Control slides and coupons (not exposed to light bulbs) were also tested at 24 hour and 72-hour intervals for comparison purposes.



II. PROCEDURE

Glass slide coupons were disinfected by soaking them in a 70% ethanol solution for 15 minutes and allowing them to air dry in a biological safety cabinet. The laminated wood flooring coupons were disinfected by cleaning the surface with wipes containing quaternary ammonium compounds. Once dry, the slides and wood flooring coupons were inoculated in triplicate with suspensions of *E. coli*, *S. enterica*, and MRSA. The slides were placed in a secure location and exposed to 6 PURE-LIGHT coated LED light bulbs for 24 and 72 hours respectively. The glass slide coupons were set on a counter approximately 5 feet from the surface of the lights. The wood flooring coupons were set on the floor of the room approximately 8 feet from the lights. At the 24 and 72-hour intervals the inoculated slide and wood flooring coupons were collected and plated using serial dilution technique onto Trypticase Soy Agar (TSA) medium to determine organism survival/reduction.

III. EXPERIMENTAL RESULTS

Initial (time zero) inoculum levels for all coupons

Salmonella – 170,000,000 per coupon

MRSA – 200,000,000 per coupon

*E. coli* – 200,000,000 per coupon

24 Hour Recovery

Wood Flooring

Test Organism	Treatment	CFU per sample		Percent Reduction
		(average)	Log Reduction	
<i>Salmonella</i>	Control (No light)	3,000,000		
	PURE-LIGHT coated LED	4,000,000	-0.12	-33.3
MRSA	Control (No light)	3,100,000		
	PURE-LIGHT coated LED	800,000	0.59	74.2
<i>E. coli</i>	Control (No light)	1,100,000		
	PURE-LIGHT coated LED	700,000	0.20	36.4



Glass Surface

Test Organism	Treatment	CFU per sample		Percent Reduction
		(average)	Log Reduction	
<i>Salmonella</i>	Control (No light)	4,300,000		
	PURE-LIGHT coated LED	2,900,000	0.17	32.6
MRSA	Control (No light)	7,400,000		
	PURE-LIGHT coated LED	4,900,000	0.18	33.8
<i>E. coli</i>	Control (No light)	3,000,000		
	PURE-LIGHT coated LED	2,100,000	0.15	30.0

72 Hour Recovery

Wood Flooring

Test Organism	Treatment	CFU per sample		Percent Reduction
		(average)	Log Reduction	
<i>Salmonella</i>	Control (No light)	2,090,000		
	PURE-LIGHT coated LED	890,000	0.37	57.4
MRSA	Control (No light)	2,150,000		
	PURE-LIGHT coated LED	430,000	0.70	80.0
<i>E. coli</i>	Control (No light)	210,000		
	PURE-LIGHT coated LED	14,000	1.18	93.3



Glass Surface

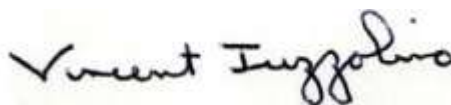
Test Organism	Treatment	CFU per sample	Percent Reduction	
		(average)	Log Reduction	
<i>Salmonella</i>	Control (No light)	1,670,000		
	PURE-LIGHT coated LED	880,000	0.28	47.3
MRSA	Control (No light)	6,850,000		
	PURE-LIGHT coated LED	1,330,000	0.71	80.6
<i>E. coli</i>	Control (No light)	1,030,000		
	PURE-LIGHT coated LED	55,000	1.27	94.7

$$\text{Percent Reduction} = \frac{(\text{Control} - \text{Treated})}{\text{Control}} \times 100$$

$$\text{Control Log Reduction} = \log_{10} \frac{\text{Control}}{\text{Treated}}$$

IV. CONCLUSIONS/OBSERVATIONS

The greatest bacterial reduction was seen after 72 hours of treatment compared to 24 hours. *E. coli* was reduced by 94.7% on glass and 93.3% on the wood surface after 72 hours of treatment. MRSA was reduced by 80.6% and 80.0% on glass and wood after 72 hours. *S. enterica* was also reduced but by a smaller degree; 47.3% on glass and 57.4% on wood after 72 hours of treatment.



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Microbiology Laboratory Director





**EMSL ANALYTICAL, INC.**



As the nation's leading environmental testing firm, EMSL's network of nationwide laboratories has been providing quality analytical services since 1981. We offer a wide array of analytical testing services to support environmental investigations focused on asbestos, microbiology, lead paint, environmental chemistry, indoor air quality, industrial hygiene and food testing. Additionally, we also provide materials testing, characterization, and forensic laboratory services for a wide range of commercial, industrial, regulatory, and law enforcement clients.

Our unmatched capacity coupled with a company-wide focus on customer satisfaction makes no project too large or too small. Our corporate research and development capabilities allow us to bring new methodologies on line quickly to meet new industry challenges and client needs. In recruiting and retaining talented and motivated scientists on a national scope, our expertise is marshaled throughout a nationwide network of analytical laboratories. We are committed to providing reliable, defensible data in a standardized and user-friendly format.



**Lab Services at EMSL:**

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- Pharmaceutical Testing
- Lead & Metals
- Legionella Analysis
- Food

