Healthcare Cleaning Solutions
by Geerpres®

Comprehensive Integrated Cleaning Solutions

In business for over 80 years, Geerpres® offers a comprehensive approach to cleaning solutions, specializing in the healthcare industry. Our system includes EVS carts, mopping systems, Advantex® microfiber (single-use) products, EVS management software, and air disinfection technology.

Geerpres® is focused on driving labor efficiencies, providing premier products, and reducing HAIs in an environmentally conscious manner.

Geerpres® delivers an integrated system that includes

- Premier, innovative equipment with proven, warrantied quality.
- Advanced supplies, providing cleaner, safer environments.
- Labor efficiency in products and technology.

Product Limited Warranties

For the period listed below, from the date of purchase, if any of these products proves defective in materials and/or workmanship during normal use by the original purchaser, Geerpres® will provide, at their discretion, repair or replacement providing all care and Maintenance procedures have been followed.

LIFETIME Limited Warranty Products:

- Enterprise® EVS Carts
- Casino 'Slot' EVS Carts

10-Year Limited Warranty Products:

- Buckets: Stainless Steel
- Wringers: Stainless Steel
- Project Trolley
- Orion Stainless Steel Cart

5-Year Limited Warranty Products:

- Wringers: Zinc-plated
- Buckets: Galvanized

Microfiber Solutions: From the Floor Up

HAI Prevention Using Engineered Single-Use Microfiber Solutions

View complete case study at www.geerpres.com/advantex-advantage/advantex-hai-solution/

Financial Implications of HAIs

- 1.74 million HAIs in the USA (2002) resulting in 98,987 deaths (5.8%).
- 39 million patient stays (2009)
  - Average HAI cost - $1,024 per admittance or $23,735 per HAI incident.
  - HAI cost - $40.3 billion (11% of total hospital spending in 2009).
- CMS penalties of $538 million (2017), impacting 2,588 hospitals.
- 1% reductions in Medicare reimbursement in 2017 for 769 hospitals.

70% of HAIs are preventable, a potential cost savings of $28 billion.

From the Floor Up – “Fear the Floor”

Pathogens are consistently introduced to the floor throughout the day by shoes, transport equipment, treatment devices or computer carts, and non-slip patient socks.

Cleveland Area Hospital Study – 5 Locations

- *Clostridium difficile* (C. diff) found in 44% of rooms after discharge and cleaning.
- 53% found while patients still in the room.
- Of 100 occupied rooms, 41% of high touch objects had contact with the floor.

Arizona Hospital Study – 11 Locations

- 93% of laundered product tested positive for contamination.

Non-slip Socks Study

- 85% on socks and 69% of floor samples tested positive for VRE.
- Patients contaminate their beds upon returning to their room.

Laundered/Washable Microfiber Flat Mop
vs.
Single-Use Microfiber Flat Mop

Comparative Analysis

Laundry Process

- Reduces the efficacy of microfiber products
- Does not eliminate cross-contamination pathogens

Cross-Contamination

- Ineffective wash processes reintroduce contaminated laundered mop back into a facility

Performance

- Removal of bio-burden is superior with virgin microfiber
- Floor coverage meets/exceeds patient room size requirements

Disinfectant Compatibility

- Launderable microfiber and most single-use microfiber are not disinfectant compatible

Environmental Impact

- Advantex® is 71% post-consumer recycled material
- Waste is nominal and can be recycled
- Advantex® is proven superior in environmental impact versus laundered mops

	Washable	Advantex® Single-Use
Reduces Detergents & Disinfectants by More Than Half	✖	✔
Delivers Disinfectant Without Neutralizing It	✖	✔
Water and Sewer Savings	✖	✔
Eliminates Energy Required for Laundering	✖	✔
Eliminates Chemical Footprint to Launder	✖	✔
Eliminates Energy Footprint to Dry	✖	✔
Water Conservation - Eliminates Wash & Waste Water	✖	✔
Reduces Global Emissions Footprint	✖	✔
Potential to Be Recycled	✖	✔
Eliminates Daily Transportation Cost / Gas Usage	✖	✔
Reduction of Manufacturing Environmental Footprint Cost, Energy, Watering Cotton, Pesticides, and Chemical Use Associated with Farming and Manual Labor	✖	✔

Challenges with Laundered Microfiber Mops

What makes microfiber good makes it bad to launder.

- Microfiber's cleaning properties make it difficult to release bioburden or pathogens in the laundry cycle.
- Microfiber allows detergent accumulation from repeat laundering.
- Laundering processes damage delicate microfibers.

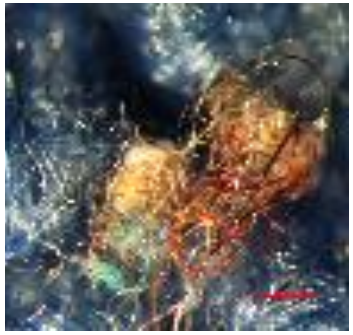
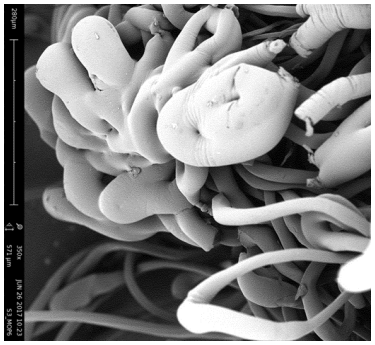
Retained contamination may include bacteria, viruses and spores.

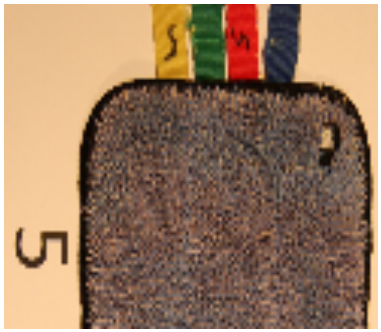
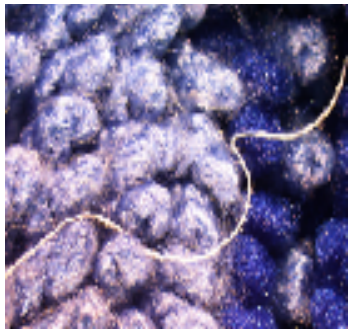
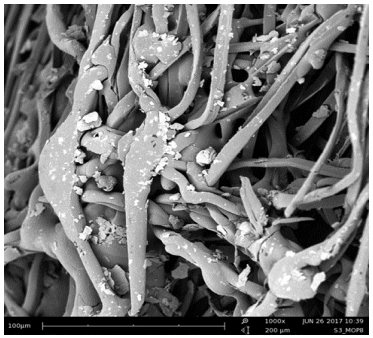
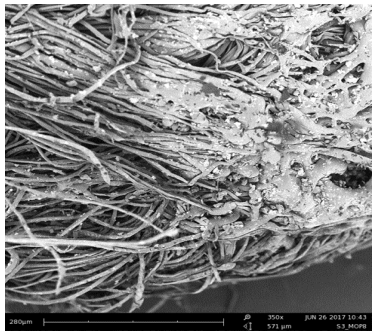
- These can and will survive inadequate or uncontrolled laundering processes.
- HAI implications result from harmful pathogens returning to your facility in a perceived "clean and sanitized" laundered mop.

Laundering Process - Current Reality

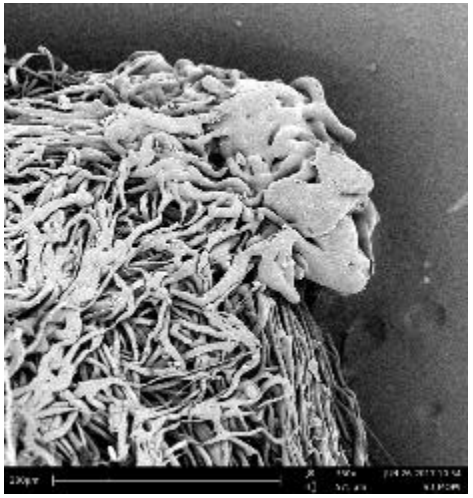
- Cross-contamination/HAI potential
- Insufficient quantities on-hand or inconsistent inventory controls
- Unknown mop origin (alternative hospital)
- Ineffective, aged, or melted mops
- Poor microfiber quality
- Unpredictable contracts and costs
- Constant chemistry waste
- Loss/replacement and disposal waste
- Required management time for reusable mop program
- Adverse environmental implications of laundered mops versus single-use options

Launderable Microfiber Mop Magnifications

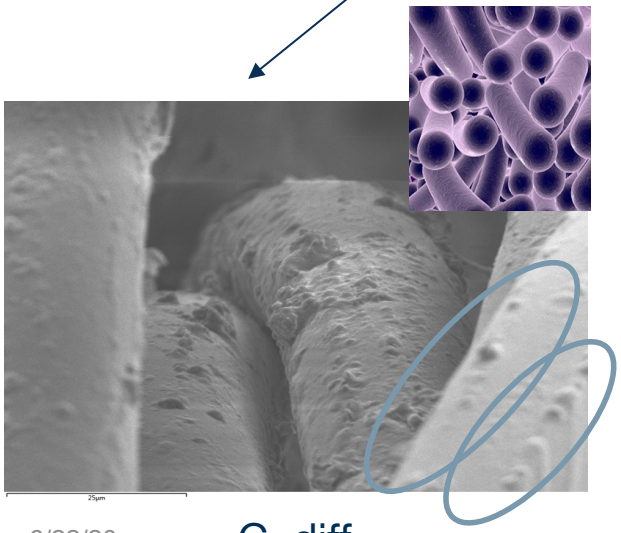
At 1000x magnification, re-laundered “clean” microfiber flat mops reflect melted fibers, bio-burden and residual contaminates reintroduced to the environment.



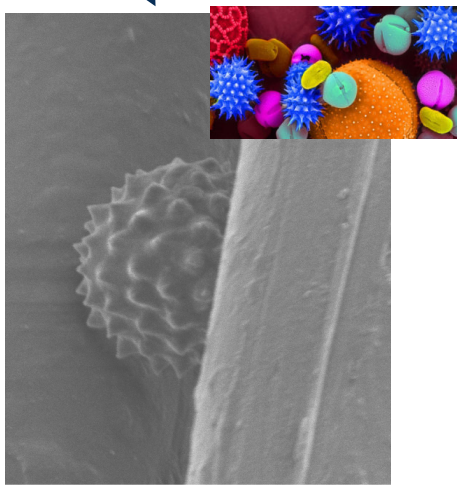
400x magnification reflects retention of unknown particulate.

Laundered Mops Are Bacterial Reservoirs

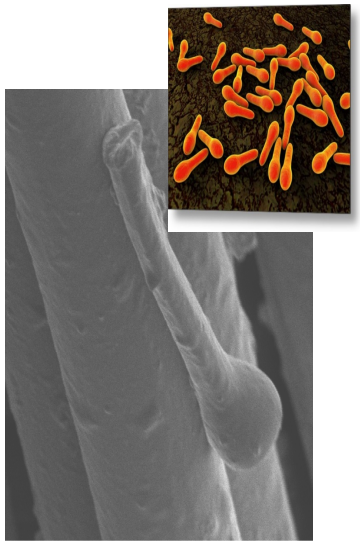
Laundered Mop
(Clean and Examined)



C. diff



Pollen



Clostridium tentani

Pathogenic Risks Using Laundered Microfiber

- 3 of 11 hospitals (27.3%) reveal returning HAI pathogens in clean laundered mops.
- 50% (3/6) of laundering services reflect adverse results (process failure).
- **35% of the laundered mops tested retained microbial contamination.**

DATA Result / # Microorganisms PER MOP					
SAMPLE #	TAC Ttl Aerobic Count	MRSA Staphlylococcus	E-Coli Escherichiacoli	C-Diff Clostridium-difficile	Yeast
1	<1000	<1000	<1000	<1000	<1000
2	<1000	<1000	<1000	<1000	<1000
3	<1000	<1000	<1000	<1000	<1000
4	<1000	<1000	<1000	<1000	<1000
5	<1000	<1000	<1000	<1000	<1000
6	11,500,000	1,200,000	<1000	430,000	2,860,000
7	8,000,000	120,000	330,000	230,000	790,000
8	350,000	40,000	<1000	150,000	40,000
9	3,500,000	600,000	<1000	1,340,000	170,000
10	300,000	20,000	<1000	150,000	20,000
11	<1000	<1000	<1000	<1000	<1000
12	<1000	<1000	<1000	<1000	<1000
13	200,000	100,000	<1000	20,000	<1000
14	<1000	<1000	<1000	<1000	<1000
15	<1000	<1000	<1000	<1000	<1000
16	<1000	<1000	<1000	<1000	<1000
17	<1000	<1000	<1000	<1000	<1000
18	<1000	<1000	<1000	<1000	<1000
19	<1000	<1000	<1000	<1000	<1000
20	240,000	20,000	<1000	<1000	<1000
21* cloth	2,430,000	940,000	20,000	<1000	<1000

Disinfectant Compatibility

Comparison Overview

A CDC study found that quaternaries are good cleaning agents, but organic materials such as cotton can make them less microbicidal because insoluble precipitates absorb the active ingredients, otherwise known as “binding” the chemistry.

Solution for Controlling HAI Pathogens

Advantex® Single-use Microfiber Mops provide **100%** of original-strength disinfectant from the charging bucket to the cleaning surface or floor **100%** of the time.

The Advantex® Advantage	INITIAL Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	1 HOUR Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	3 HOURS Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	INITIAL Neutralizing CHLORINE Disinfectant reaching floor from test mop	1 HOUR Neutralizing CHLORINE Disinfectant reaching floor from test mop	3 HOURS Neutralizing CHLORINE Disinfectant reaching floor from test mop
Advantex® Single-Use Mop	PASS	PASS	PASS	PASS	PASS	PASS
Competitor Single-Use Mop	PASS / FAIL	FAIL	FAIL	PASS / FAIL	FAIL	FAIL
Laundered Mop	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL

Detergent and Disinfectant Compatibility

Can the Impact Be Quantified?

Advantex® Single-use Microfiber Mop

- 10 – Advantex® mops require only 1.5 gallons (5.6 liters) of chemistry solution.
- Chemistry remains active and effective indefinitely.

Laundered Mops

- 10 – Laundered mops require 4.0 gallons (15 liters) of chemistry solution.
- Chemistry is neutralized almost immediately, impacting an entire “charge” of mops.

Coverage Performance

MOP Absorbency and Application Efficacy											
MOP	Dry Wt. (g)	Wet Wt. (g)	Solution Absorbed Wt. (g)	Post Application Wt. (g)	Solution Delivery (g)	% Fluid Release	Floor Coverage (sq. ft.)	Solution Waste (g) per Use	% Fluid Waste	Quat Binding (1 Hr)	Quat Binding (3 Hr)
ADVANTEX®	18.8	168.9	150.1	24.9	144.0	95.9%	250	6.2	4.3%	NO	NO
Brand B	15.7	122.6	106.9	24.5	98.1	91.8%	168	8.7	8.9%	YES	YES
Brand C	13.2	141.0	127.8	37.6	103.4	80.9%	185	24.4	23.6%	YES	YES
Brand D	13.1	138.8	125.7	39.1	99.7	79.3%	178	26.0	26.1%	YES	YES
Brand E	22.8	205.1	182.2	68.1	137.0	75.2%	245	45.3	33.0%	YES	YES
Brand F	16.2	137.1	120.9	46.3	90.8	75.1%	158	30.1	33.1%	YES	YES
Brand G	12.5	130.9	118.4	48.6	82.2	69.5%	147	36.1	43.9%	YES	YES
Brand H	23.6	179.3	155.7	87.5	91.8	59.0%	159	63.9	69.6%	YES	YES
Laundered Mops	94.0	496.0	402.0	342.0	154.0	38.3%	267	248.0	161.0%	YES	YES

- Advantex® offers the highest coverage of any single-use mop! Patent pending.
- Launderable mops offer greater floor coverage but waste more cleaning solution than is actually used, which carries an increased operating cost.

GEERPRES

Are You Wasting Disinfectant?

FLOOR MOP ABSORBTION COMPARISON

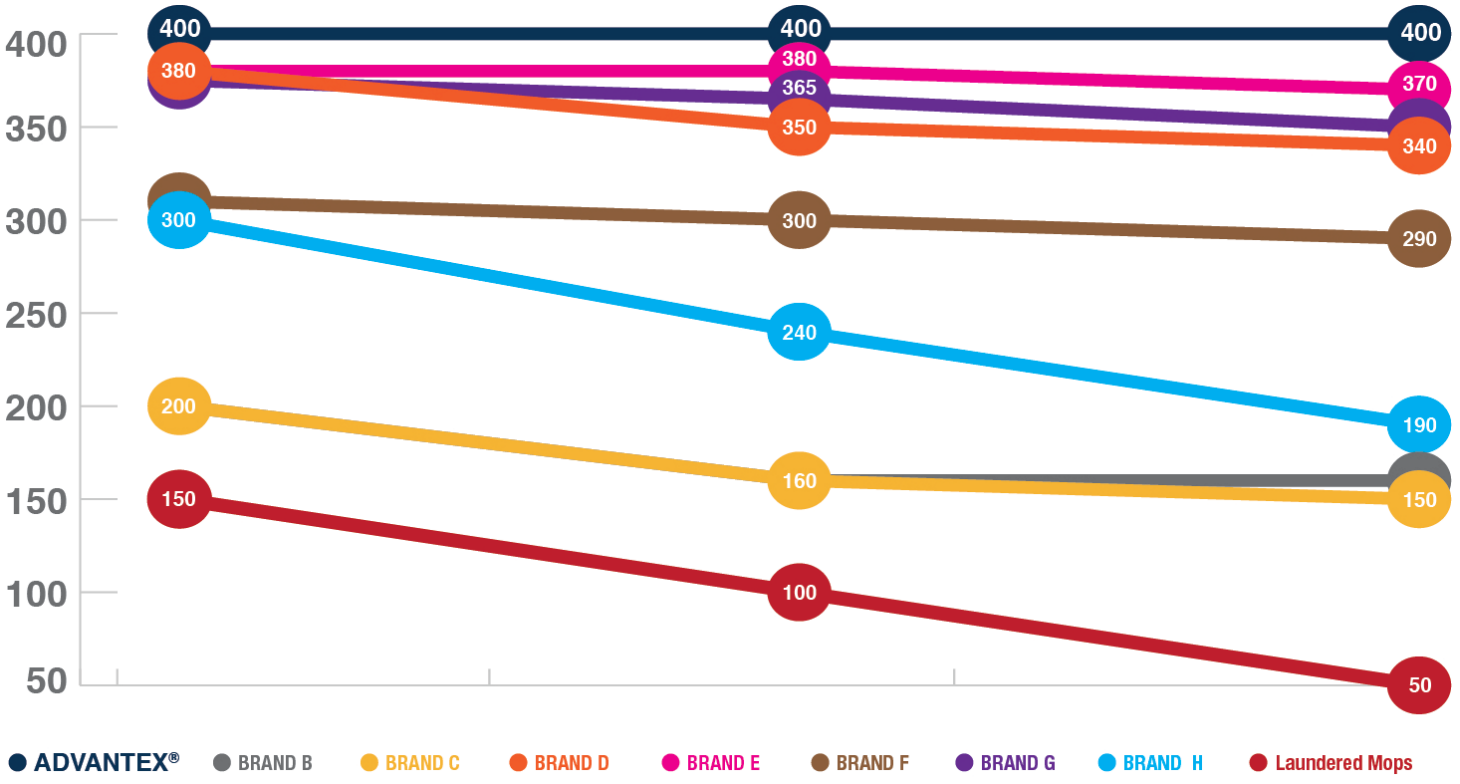
The Advantex® Advantage	Amount of Disinfectant to charge 10 mops	% Solution Release	% Solution Waste	After Charging Neutralizing QUATERNARY AMMONIUM Disinfectant	After Charging Neutralizing CHLORINE Disinfectant
Advantex® Single-Use Mop	0.5 gal	96%	4%	PASS (660 ppm)	PASS (500 ppm)
Competitor Single-Use Mop	0.5 gal	59%	41%	FAIL (<660 ppm)	FAIL (<500 ppm)
Laundered Mop	2.5 gal	38%	62%	FAIL (<660 ppm)	FAIL (<500 ppm)

Pass/Fail grade is based on the Centers for Disease Control and Prevention's recommendations of 660 parts per million of quaternary compatibility ammonium disinfectant or 500 parts per million of chlorine disinfectant. All mops were placed in clean charging buckets with equal amounts of disinfectant. The original disinfectant was 660/500 parts per million, respectively.

Moving to Single-use Mops

Microfiber Mops in Neutralizing Quaternary Ammonium Disinfectant

Quaternary Compatibility (1 MOP in 400 ML of 400 PPM)



Floor Mop Disinfectant Comparison Findings

FLOOR MOP DISINFECTANT COMPARISON FINDINGS

The Advantex® Advantage	INITIAL Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	1 HOUR Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	3 HOURS Neutralizing QUATERNARY AMMONIUM Disinfectant reaching floor from test mop	INITIAL Neutralizing CHLORINE Disinfectant reaching floor from test mop	1 HOUR Neutralizing CHLORINE Disinfectant reaching floor from test mop	3 HOURS Neutralizing CHLORINE Disinfectant reaching floor from test mop
Advantex® Single-Use Mop	PASS	PASS	PASS	PASS	PASS	PASS
Competitor Single-Use Mop	PASS / FAIL	FAIL	FAIL	PASS / FAIL	FAIL	FAIL
Laundered Mop	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL

Pass/Fail grade is based on the Centers for Disease Control and Prevention's recommendations of 660 parts per million of quaternary compatibility ammonium disinfectant or 500 parts per million of chlorine disinfectant. All mops were placed in clean charging buckets with equal amounts of disinfectant. The original disinfectant was 660/500 parts per million, respectively.

Bio-Burden (Soil) Removal

Glo germ/flour tests using various types of mops.

- Inexpensive but subjective.
- Single-use mops have a higher contact surface.

Lab Report 129

- Advantex® Mop removed soils better than new and laundered microfiber mops.
- Advantex® Mop is proven to provide a 3 to 4 log (99.9% to 99.99%) removal of bio-burden.
- New, reusable microfiber mops lose their efficacy to remove bio-burden through repeated wash and dry cycles.

1 2 3 4 5 6

1. Advantex®
2. Rubbermaid/Cintas-Used
3. Rubbermaid/Cintas-Used
4. Rubbermaid Hygen-New
5. Rubbermaid/Cintas-Used
6. Advantex®

Environmental Implications

Waste Considerations / Recycling Possibilities

Solid waste generated from Advantex® mops equates to 18 grams per mop.

In a fully occupied 500 bed hospital -

- Each staffed hospital bed creates 33 pounds/day of solid waste (4,396,425 pounds annually).
- Advantex® would produce approximately 41 pounds/day of solid waste (a 0.25% increase in waste generation).

Only Advantex® can be recycled, when processes become available as the scale of the single-use product increases.

- Advantex ® contains 71% post-consumer material.

Life-Cycle Environmental Analysis

Study performed by Dr. Richard Venditti, College of Natural Resources at NC State University. He conducted an environmental impact life cycle assessment comparing reusable microfiber mops to the Advantex® Single-use Microfiber Mop.

Summary

The Advantex® Single-use Mop has significantly lower environmental impact than does the reusable mop in every environmental impact category in the EPA TRACI model.

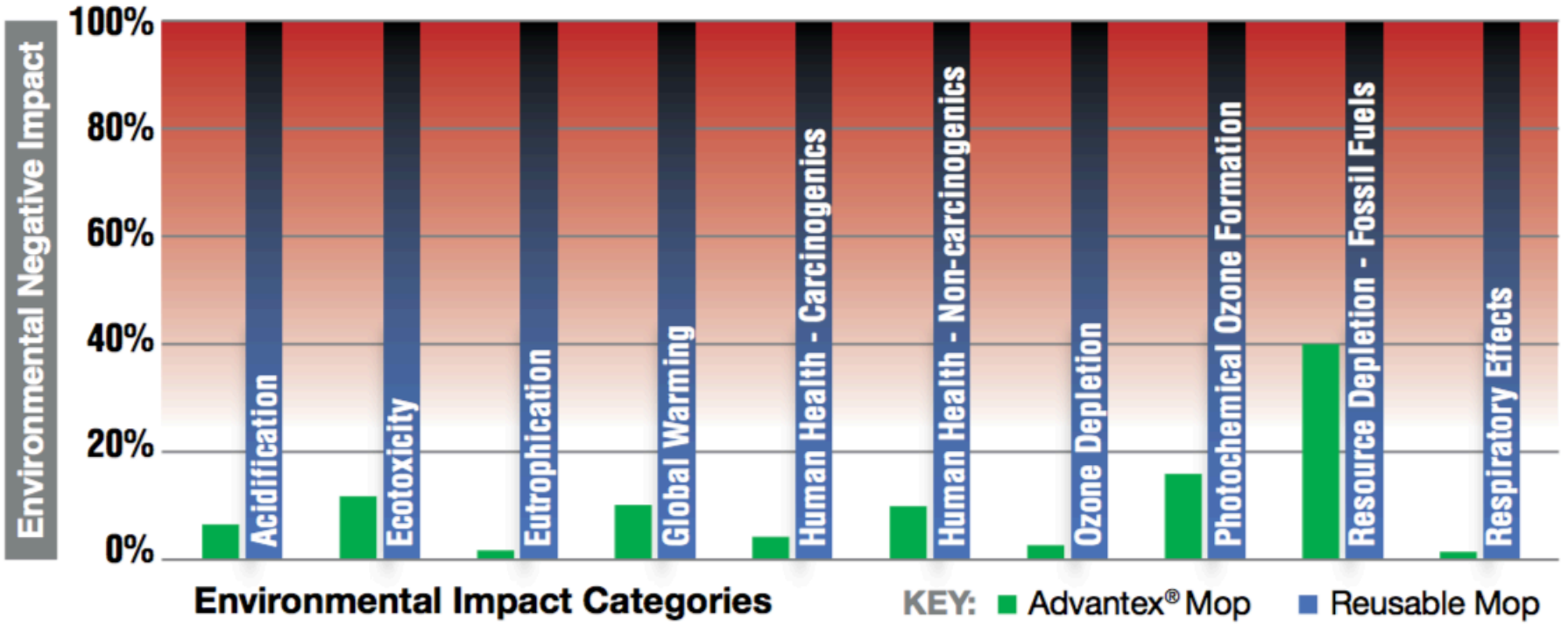
Report Model

Each type of mop was evaluated for 100 uses. The **Advantex® Single-use Mops** were each used one time then disposed of after transporting 20 miles to an incineration facility.

The **reusable mop** was used one time for each application, followed by a washing and disinfection step, followed by drying. The reusable mop was cleaned, dried, and transported 40 miles daily and then to an incineration facility. Cleaning of the reusable mop included the use of a washing machine and both detergent and bleach.

Life-Cycle Environmental Impact

The Advantex® Single-use Mop represents a fraction of the adverse environmental impact in comparison to laundered/reusable mops.



Summary

Microfiber Solutions: From the Floor Up

HAI Prevention Using Engineered Single-Use Microfiber Solutions

See our complete case study at www.geerpres.com/advantex-advantage/advantex-hai-solution/

A Refresh of the MOST Important Factors

- Total annual HAI cost of $40.3 billion (2009)
  - 4.5% of patients discharged are afflicted with an HAI
  - Average cost of $23,735 per HAI incident
- 5.8% fatality rate resulting from HAIs
- Significant CMS penalties
- 1% reductions in Medicare reimbursement for “repeat offenders”
- Up to $147 billion in direct/indirect, non-medical social costs

Appendix/Sources

- From the Floor Up – White Paper
- Cleveland Clinic
- North Carolina State Univ. – Cross-Contamination
- Bacterial Testing – Flawed procedures (mop test regarding disinfectant)
- Demonstrate Quat Binding – Table top team demonstration
- Report 103-G – Quat Compatibility
- Report 104-G – Chlorine Compatibility
- Report 105-G – Microscopic Analysis
- Report 107-G – Microbiological Mop Testing
- Report 110 – Glo Germ Methodology
- Report 127 – Bacteria on Mops
- Report 128 – Glo Germ on Laundered Mops
- 1893 Mop Patent
- EPA Mop Testing
- Improving the Cleaning Environment
- 1966 Cleaning of Hospital Floors
- Becker's Infections – HAI Unintended Costs
- AJIC – Hospital Floors Underappreciated
- Journal of Hospital Infection – Non-Slip Socks for Bacteria
- Journal of Hospital Infection – Contamination of Laundered Cloths
- Microbiological Test Method
- Forceps- Disposable vs. Reusable
- Microfiber Cloth Efficacy Decreases with Washing
- CDC Disinfection 2008
- CDC Inactivation of C diff
- Infection Control Today – State of the Industry 2017
- APIC and Hospital Floors
- Journal of Hospital Infection – Assessing Microfiber Efficacy
- Infection Control Today – HAI Prevention
- AJIC – Microbial Contamination of Reusable Microfiber

Appendix/Sources

- Pub Health Reports – Estimating Health Care-associated Infections and Deaths in U.S. Hospitals
- National Center for Preparedness, Detection, and Control of Infectious Diseases Coordinating Center for Disease Control and Prevention – The Direct Medical Costs of Healthcare-associated Infections in U.S. Hospitals and the Benefits of Prevention
- American Journal of Infection Control – Are Hospital Floors an Underappreciated Reservoir for Transmission of Health Care-associated Pathogens?
- American Journal of Infection Control – Microbial Contamination of Hospital Reusable Cleaning Towels
- Journal of Hospital Infection – Non-slip Socks: A Potential Reservoir for Transmitting Multidrug-resistant Organisms in Hospitals?
- Ecolab – Quat Absorption on Textiles Absorption of Cleaning Cloths
- Life Cycle Analysis – XLS Data Sheet to Evaluate Costs
- Professor Richard Venditti – North Carolina State University
- CDC Website – https://www.cdc.gov/infectioncontrol/guidelines/disinfection/disinfection-methods/chemical.html
- The Green Lantern, Illuminating Answers to Environmental Questions – Wasting Syndrome-How Much Trash Do Hospitals Produce?

Questions or Inquiries

Please contact your local Geerpres® Sales Representative or Distributor at

https://www.geerpres.com/resources/sales-rep-locator/

or

(231) 773-3211 or **sales@geerpres.com**