



Navigating Our New World of Reusable Microfiber Cleaning Products for Use in Healthcare

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SUMMARY

This report seeks to help healthcare practitioners navigate the world of reusable microfiber cleaning products for use in healthcare. First, we will explain some of the science around microfiber and why it is an ideal technology for cleaning the healthcare environment. Next, we will guide you in choosing the correct microfiber systems for the required purpose. We will limit our discussion to reusable microfiber cleaning products for use in healthcare settings. Single-use microfiber products or reusable microfiber products for use in non-healthcare settings are not discussed. A future report will look at the proper processing of microfibers.



The Switch from Disposable to Reusable

COVID-19 has caused a dramatic switch from disposable to reusable protective gowns for use by healthcare personnel (HCP). Reusable gowns offer clear environmental advantages, superior performance and protection, financial benefits, and more predictable availability. Conversely, disposable gowns are discarded in our landfills after one use and typically do not employ local workers in their reprocessing. These same advantages apply to reusable microfiber cleaning products for use in healthcare.

Anyone who has been to a grocery store since COVID-19 has noticed that single-use cleaning products, such as disinfectant wipes, are challenging to acquire. These same shortages are being felt in healthcare settings as demand has skyrocketed due to COVID-19. The focus on effective environmental cleaning has

never been more critical. According to the Centers for Disease Control and Prevention (CDC), the contaminated environment in healthcare plays a direct role in the transmission of a wide range of healthcare-associated infections, including SARS-CoV-2, the coronavirus that causes COVID-19. Fortunately, reusable microfiber cleaning products are again coming to the rescue. In addition to clear environmental advantages, reusable microfiber cleaning products, when cleaned in an accredited laundry, offer superior performance as well as more predictable availability. Their cost per use is typically far below single-use disinfectant wipes and they support local jobs to reprocess.

THE MAGIC BEHIND THE SCIENCE OF MICROFIBER

Microfiber refers to a synthetic fiber measuring less than 1 denier, a unit of fineness for synthetic fibers, based on a standard mass per length of 1 gram per 9,000 meters of yarn. For reference, a human hair is approximately 20 denier. Most reusable high-performance microfiber products, used in healthcare cleaning, are made from synthetic polymer materials, most commonly polyester and polyamide (e.g. nylon).

These are typically extruded through a mold (called a spinneret) to form a bi-component filament of a small cross-sectional diameter referred to as segmented pie. The filament is then drawn to stretch and make it smaller.

Higher quality microfiber products undergo a second process called “Splitting.” “Splitting” occurs when combining an increase in pH, heat, and mechanical forces used to approach the melting point of the polyamide causing the polyamide to shrink away and separate from the polyester. This process results in superfine polyester triangular fibers resulting in a huge surface area resulting in a dramatic increase in absorption capacity. The synthetic polymer materials and the extrusion and splitting process are responsible for many of the magical properties of microfiber.



THE MAGICAL PROPERTIES OF MICROFIBER

Strength, Durability, Absorbency, Superior Cleaning

- **Increased tensile strength** – High-quality bi-component splittable microfiber products are made from continuous filaments so they are much more durable and lint-free. Single-use spun-bond or melt-blown wipers/mops or cotton wipers/mops, which are made from short chopped up fibers, deteriorate quickly. High quality knitted reusable microfiber cleaning products can withstand excessive stresses without losing their structural integrity.
- **Highly durable**– High-quality reusable microfiber cleaning products will last through many cleaning and processing cycles. Durability and quality vary greatly and are dependent on the quality of the microfiber yarn used, its composition, and the knitting technology used (i.e.: circular knit vs. warp knitting). High-quality reusable microfiber cleaning products will last through many cleaning and processing cycles.
- **Exceptionally absorbent** – Splittable bi-component (polyester/polyamide) microfiber products have enormous surface areas for their weight. Consequently, they have some of the highest absorption capacities of any material known. Some high-quality microfiber wipers have more than 300 miles of fiber in a 12" x 12" wiper and can absorb as much as 8 times their weight in fluid! This means materials in the water including pathogens will also be absorbed by microfiber.
- **Superior cleaning action** – Microfiber fibers, due to their size and composition, develop a natural positive electrostatic charge, while most organic particles (e.g., dirt, dust, bacteria, pollen, most pathogens, etc.) are negatively charged. Therefore, microfibers, with their tremendous surface area and microscopic triangular shape can attract (when dry) and trap efficiently most organic matter. The hundreds of miles of ultra-thin fiber mean that germs and pathogens get stuck in the web of fiber. This makes microfibers among the most effective surface cleaners known.



CHOOSING A MICROFIBER SYSTEM THAT SUPPORTS INFECTION PREVENTION

Not All Microfiber Is Created Equal

It is important to carefully research the many factors that differentiate microfiber quality.

The first step in this analysis is to understand the comprehensive environmental cleaning and disinfecting goals and performance indicators in your healthcare facility. For example:

- What are the cleaning and disinfecting parameters in various locations?
- What microorganisms is your cleaning program targeting?
- What is the required room turnaround time?
- What are the cost constraints?
- Are there any special cleaning personnel or training considerations?
- What chemical disinfectants will be used with the microfibers?
- How/Where will the microfibers be processed?

Also, it's important to have a clear understanding of the difference between cleaning and disinfecting. Cleaning involves removing dirt, germs, and pathogens and is necessary before disinfecting. Disinfecting involves killing pathogens using an EPA registered disinfectant.

Once the above is understood and documented, it becomes more straightforward to choose the best reusable microfiber cleaning products that help achieve your comprehensive environmental cleaning and disinfecting goals.

There are hundreds of factors that determine microfiber system quality. Consult peer organizations to learn about their experiences with different microfiber systems. Partner with your accredited healthcare laundry provider – the experts in providing hygienically clean healthcare textiles for patient and staff use. They



are also the likely experts in providing high-quality microfiber systems that support infection prevention. Most will offer a microfiber system rental program.

Other Key Factors to Consider

Other key factors in a microfiber system to investigate include:

- **Durability** - Durable high-quality microfiber products should be able to withstand more than 200 healthcare laundering cycles while retaining their performance. Research microfiber durability claims or better yet test them yourself. Pay close attention to disinfecting chemicals used by your healthcare facility. Many contain high bleach concentrations and can break down microfibers and cause them to lose their performance.
- **Absorption rate** – Absorption rate is closely tied to the microfiber material composition (a 50 % polyester / 50% polyamide is better), fiber size (lower is better), electrostatic charge (higher is better), and ultimately the surface area per weight (higher is better). A simple test is to weigh the wipers when saturated and compare their weights. Find products that lead in these factors.
- **Cleaning performance** – Cleaning performance is also related to the above factors. The best way to assess cleaning performance is with a side-by-side test using several different microfiber products. Measure how they perform cleaning a standardized surface load. The results should become obvious quickly. Explore documentation on cleaning performance for each product being analyzed.
- **Microbial removal** – High-quality microfiber cleaning products score highest in microbial removal tests. Reputable microfiber manufacturers should have accredited lab test results demonstrating the percentage of various microbes removed by their product. Compare these and choose the product that performs best against targeted pathogens in your facility.
- **Cost** – Cost involves more than the cost of the microfiber product and must be looked at comprehensively. Cost per use is a better metric. To find



this number, divide the purchase cost of the microfiber by the expected number of uses. Add this to the processing cost per use. Don't forget to factor in the costs for hardware, such as mop handles and holders, as these can be expensive. Make sure to assess how long it takes to clean a room using the product. More expensive products that cut room cleaning time by a large percentage will end up saving more money in the long run.

- **Color-Coding Support** – Look for microfiber systems that support color-coding. It can be advantageous to segregate microfiber products by functional area. For example, it may make sense to use one color for the bathrooms, one color for the OR, one color for patient rooms, and one color for the kitchen.

CONCLUSION

The many benefits of reusable microfiber cleaning products for healthcare are undisputable. Many papers have been published by organizations such as the Environmental Protection Agency (EPA), the CDC, and the Joint Commission extolling the virtues of using microfiber. They are more cost-effective, clean better, leave a smaller environmental footprint, and produce better outcomes for patients, to name a few. COVID-19 has highlighted many of the risks of relying on fragile supply chains where disposable products are manufactured thousands of miles from the end-user in factories with suspect quality practices. As a result, it is easy to understand why an unprecedented number of healthcare organizations have used evidence-based decision making and converted to reusable microfiber cleaning systems with overall positive results.



*About the Author

Gregory Gicewicz (photo, right) is distinguished in the reusable textile industry as a tireless advocate for increasing awareness of the significant role that having high standards in the processing of healthcare laundry plays in broader infection prevention strategy. He is president & CEO of [Sterile Surgical Systems](#), a full-service accredited healthcare laundry and reusable sterile surgical textile pack manufacturer. He is past president of the Healthcare Laundry Accreditation Council (HLAC), currently serves as HLAC inspection committee chair, and led a committee that developed the HLAC Laundry Process Monitoring Toolkit.



About HLAC

The [Healthcare Laundry Accreditation Council \(HLAC\)](#) the leading nonprofit organization that inspects and accredits laundries that process reusable textiles for hospitals, nursing home and other healthcare facilities – based on the highest, professionally recognized standards for patient safety and infection prevention.

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