Keeping Up Appearances

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The winter months can be tough for the professional cleaning industry. Snow, rain and sleet can play havoc on building floors and carpets.

For carpet cleaners, their business can come to a virtual stop during the cold winter months. This is because outdoor conditions, and their impact on the indoor environment, can be so bad that facility managers believe it is simply not worth it to clean carpets, or strip and refinish floors. After all, they think, the floors will just get soiled again quickly and need to be recleaned.

This places an even greater burden on cleaning professionals. As carpets and floors become dirty, facility managers ask more of cleaning crews to do whatever they can to keep the unsightly soiling to a minimum. Added to this burden is the fact that the winter's grit, dirt and contaminants are not only deposited on floors but become airborne as well, ending up on desks, counters and surfaces, high and low, throughout the building.

It is estimated that for every 1000 people walking into a school, for example, as much as 10 pounds of soil is walked in as well. Further, it is estimated that it costs about $750 to remove one pound of dirt from a facility. With more than 5.3 million school age students, you see how quickly this amount of traffic – along with soiling and cleaning costs – can accumulate. This means that these facilities will need more dusting and vacuuming during the winter months, all requiring more time – and adding to the workload – of cleaning professionals.

And winter's cleaning burden does not fall just on cleaning professionals. It costs facility managers money as well. When carpet cleaning is delayed, for instance, it harms carpet fibres causing expensive carpeting to wear out sooner and need replacement. The more grit and grime walked on to floors, the more work and time to scrub, strip and refinish will be required when warmer months return.

The White Knight on the Floor

Although winter presents many challenges for cleaning professionals and the managers of facilities, we do not need to become victims of its cleaning wrath. Because the problem centres around the soil collected on the bottom of shoes, steps taken to remove or prevent this soil from entering the facility can help minimize the soiling and harm to carpets and floors, as well as reduce the workload of cleaning professionals.

In some countries they do this in a simple way: they remove their shoes at the door. This is

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common in Japan, Thailand, the Czech Republic and Sweden. In some New England states in the United States, hospitals and other large public facilities once had 'mud rooms' where building users could take off and leave their boots and galoshes. Mud rooms served as a barrier between the outside and the inside of the facility, preventing soils from being walked into the facility.

Although still common in houses, few public facilities have mud rooms any longer. Instead they now turn to high-performance matting systems to minimize the amount of soil and contaminants brought in from the outside. It is estimated that these mats, made using state-of-the-art technologies, can trap and capture 70 to 80 per cent of the soil on shoe bottoms, a significant reduction that helps keep facilities clean.

What Are High-Performance Mats?

Many facilities, unaware of the importance of matting systems, rent mats or purchase low-performing mats, often at big-box stores. Although these mats can help reduce the amount of soiling in a facility, they are not engineered to trap anything near 80 per cent of shoe bottom contaminants. Additionally, these "standard" mats often require frequent cleaning, and this, along with the fact that they are not designed to have a long performance life, results in frequent replacement. Although they may cost less to purchase initially, astute facility managers soon realize they are not cost effective in the long run.

High-performance mats are engineered to be more effective at stopping soil at the door as well as to last for an extended period of time. One way they do this is through dual-level construction. With this system, soils, moisture and other outdoor contaminants are stored below shoe level, which prevents them from being transferred into a building. Mats without this construction can flatten out over time, and as soil is deposited on these mats, it can reattach to the shoe and be tracked into the facility, completely defeating the purpose.

These mats may cost more than the standard mats mentioned earlier, however, a look at their warranties shows how cost effective a high-performance matting system can be. A standard or low-performing mat may have a warranty as short as three months, while a high-performing matting system may have a warranty that extends as much as six years. This also makes them more sustainable, reducing the amount of cleaning-related waste deposited in landfills.

The Rule of 15

High-performance mats are most effective as a system, using three different types of mats of approximately five feet each – scrapers, wiper/scrapers and wiper mats. These work together to prevent contaminants from entering a facility. This is referred to as the Rule of 15:

- Five feet of scraper mats are placed outdoors to trap as much as 50 per cent of all soils and contaminants from entering a facility.
- This is followed by five feet of wiper/scraper mats, typically placed in a vestibule between doors or directly inside a facility to gather dust and debris not captured outdoors.
- Wiper mats, again five feet long, are often referred to as the 'final line of defense' and are designed to capture any remaining soils and contaminants.

The system is so effective it has become an integral part of Green cleaning. Many Green cleaning experts say they are about the best source-reduction strategy available to help keep soils outside.

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Do The Numbers: The Mathematics of Cleaning

tensive and are based on average effort and real life productivity. It's possible to compare dust mopping with sweeping and with vacuuming, or spray buffing with burnishing as well as window cleaning with different methods. At last count there were 447 standard times in the handbook and more are being added each year.

In addition to the ISSA times there are task times published by APPA dealing with the cleaning of specific area types, such as classrooms, shower rooms, corridors, stairwells, offices, laboratories and a range of room types with different floor finishes. APPA developed a cleaning standard incorporating times and frequencies needed to achieve a range of quality levels and published the data in *Custodial Staffing Guidelines for Educational Facilities*. The APPA standards have been adopted by the U.S. Green Building Council for LEED Building standards and are extremely useful for planning and justifying staffing levels.

Absenteeism versus inefficiency: Much effort is involved in attendance management programs designed to reduce absenteeism with the aim of reducing labour costs. There will always be a minimum level of absenteeism with the aim of reducing labour costs. There will always be a minimum level of absenteeism due to illness or injury that no program will reduce although chronic attendance abusers should always be targeted. If as much effort was applied to efficient time management on the job as there is to absence management, the labour savings would be very significant. For example.

For a staff of 100 with an absence average of seven days per year, the time loss is 7 x 100 x 7.5 hours... 5250 hours per year.

For a staff of 100 with time loss of 15 minutes each per day due to extended breaks and late starts or inefficient assignments, the time loss is:
100 x 260 x 15 ...6500 hours per year
60

In discussions with custodial managers over several years, I've found that the typical time loss is more like one hour per day. That really is an opportunity for cost reduction that should be addressed.

Simple calculator tools for the formulas listed above will save readers time and frustration. They are available to use (at no cost) on our web site at www.groupb.ca/Services.html click on 'Supervisors Toolkit'. In the tight times that we are facing using guesswork is not a wise practice. Also, it's always a good idea to remind your administration that there is much more to custodial management than a mop and a bucket.

sion. The routine use of disinfectants to disinfect hospital floors and other surfaces (eg. Bedside tables or bed rails) remains controversial. That said, there are a number of reasons to encourage use of disinfecting products to decontaminate environmental surfaces including[12]:

1. Epidemiologically important microbes (e.g. VRE, MRSA, *Clostridium difficile*, and viruses) can survive on environmental surfaces for long times and the use of a disinfectant can eliminate them or significantly reduce their number while the use of a cleaning agent may result in cross contamination.

2. Disinfectants are required in the United States and Canada for decontamination of surfaces contaminated by blood and other potentially infective material.

3. Detergents become contaminated and result in seeding or cross-contamination of the patients' environment with bacteria.

4. Disinfectants are more effective than detergents in reducing the microbial load on floors.

5. Disinfection of non-critical equipment and surfaces is recommended for patients on isolation precautions by the Centres for Disease Control and Prevention, and Public Health Agency of Canada.

The advantage of using a single product for decontamination of non-critical surfaces (including floors and equipment) simplifies both training and practice. Even though there is a debate on using either a cleaning or disinfecting agent to decontaminate the environmental surfaces, there is a consensus that at least one of them should be used. Even if a cleaner is intended to be used, it should have good cleaning performance, since all studies to support the contribution of cleaning agents have been generated using detergent with decent cleaning performance. Cleaning performance of a cleaner mostly comes from the contribution of surfactants used in the formulation. If surfactants are removed from a detergent formulation, the wetting capability and consequently cleaning performance decrease significantly. This will result in ineffectiveness of product for using as a detergent.

Microbial resistance:

Recently, studying bacterial adaptation and resistance to antiseptics and disinfectants has had considerable interest[14]. This is due to the fact that there is not enough knowledge in this field where as the resistance to antibiotics has been well studied[15]. Understanding the microbial resistance to different types of biocides and potential cross-resistance can be very helpful in reducing usage of potential resistance developers, and consequently to decrease the risk for developing more resistance bacteria in our environment. In general, the mechanism of bacterial resistance to biocides is essentially of two types, via Intrinsic and Acquired[15].

- Intrinsic resistance is the natural, chromosomally controlled property of a bacterial cell that enables it to circumvent the action of a biocide. It is most commonly found in gram-negative bacteria, in mycobacteria and in bacterial spores. Additionally, physiological (phenotypic) adaptation is considered to alter the intrinsic resistance of bacteria – e.g. of cells contained within a biofilm[16].
- Acquired resistance to biocides results from genetic changes in a cell and arises either by mutation or by acquisition of genetic material from another cell[15]. Acquired, resistance to biocides can result when bacteria are exposed to gradually increasing concentrations of a biocide. Examples are provided by highly QAC resistance *Serratia marcescens*, and chlorhexidine-resistant *E.coli*, *P.mirabilis*, *P.aeruginosa* and *S. marcescens*[17,18].

Resistance development to biocides:

The association between chronic sublethal exposure to bacterial monocultures to biocides and changes in susceptibility to both the biocides and antibiotics has been demonstrated unequivocally in the laboratory[19]. Such phenomenon has not yet been demonstrated any relevance to the real world[19]. If the increasing use of antibacterial agents within consumer products is likely to impact antibiotic resistance within the home, similar effects should already be apparent in clinical and hospital settings[19].

Minimum inhibitory concentrations (MICs) have been used to evaluate the emergence of biocide resistance in bacteria. However, the possibility of failure to achieve disinfection standard because of the elevated MICs is debatable since significantly higher concentrations are used in practice[20]. Studies carried out with biocides in their use level, demonstrate that there isn't less susceptibility to use dilutions of biocides against the bacteria with elevated susceptibility in MIC level[21-23].

Arguably, such studies support the view that antiseptic use in hospitals does not contribute to the biocide susceptibilities of *enterococcal* isolates. Additionally, studies conducted on the susceptibility of antiobiotic-resistant bacteria showed that there was no correlation between resistance to antibiotics and a decreased susceptibility to antiseptics or disinfectants[24]. This seems to be due to the biocidal concentration factor. Biocidal concentration is a key factor in biocidal activity[20]. Most biocide formulations contain high concentrations of active agents to achieve an optimal, broad-spectrum activity for direct use on an inanimate surface, skin and in water[25]. The mechanism of action for biocides in their MIC and in their disinfection concentrations is different[26]. It is generally accepted that most biocides, at high concentrations is different[26]. It is generally accepted that most biocides, at high concentrations act in a non-specific way[25]. This seems to be very relevant especially for oxidizers. Since selection or transfer of determinants for reduced susceptibility will only apply to biocides which have selective target sites, it seems unlikely (although not impossible) that is could occur with chemically reactive agents such as oxygen-releasing agents[19], or with solvent molecules such as alcohols[27]. This likelihood is further reduced by the fact that these agents are unstable or volatile, and do not persist in the environment in an active form[19].

Non-ionic surfactants have no antimicrobial activity[8] and therefore no acquired microbial resistance would be developed for them. Anionic surfactants have very low antimicrobial activity only in acidic solution, and do not have any residual activity, and therefore microorganisms would not develop any resistance against them. As per the authors' knowledge, there is no study available to support the hypothesis that non-ionic or anionic surfactants cause microbial resistance.

In summary, the mechanism of resistance to chemical germicides is often dependent on the concentration of the germicide. At high concentrations multiple structural and metabolic targets are involved, and at low concentrations fewer targets are entailed[8]. On the other hand, some of these disinfectants, such as chlorine, have been around for a long time. Based on the current evidence, it seems that intrinsic and acquired antimicrobial resistance occurring in response to biocide exposure is not a significant problem, per se[19].

Concluding remarks

Surfactants are a large class of chemicals and have different physical, chemical and toxicity properties. Some, like quaternary ammonium compounds (cationic surfactants), have microbial activity where as nonionics do not provide microbial activity. Some including alkyl phenol ethoxylates are toxic to aquatic life, and not environmentally favourable while others, such as LAS and AE, are readily biodegradable and do not accumulate in the environment.

That said, the responsibility remains on the shoulders of the product manufacturers to develop products which have a balance in their performance and environmental profile.

CSSA... Keeping You Informed.

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Often they suggest even more than 15 feet of matting be placed at key door entries.

There is little we can do about the weather, but fortunately, with high-performance matting systems, there are things we can do to help keep contaminants from entering a building no matter what time of year it is. As winter approaches, cleaning contractors should suggest that their clients invest in these more effective matting systems. Cleaning and related costs as well as workloads may be reduced, and it makes contractors a more vital part of their customers' building operations.