



E-BOOK

FOOTWEAR HYGIENE

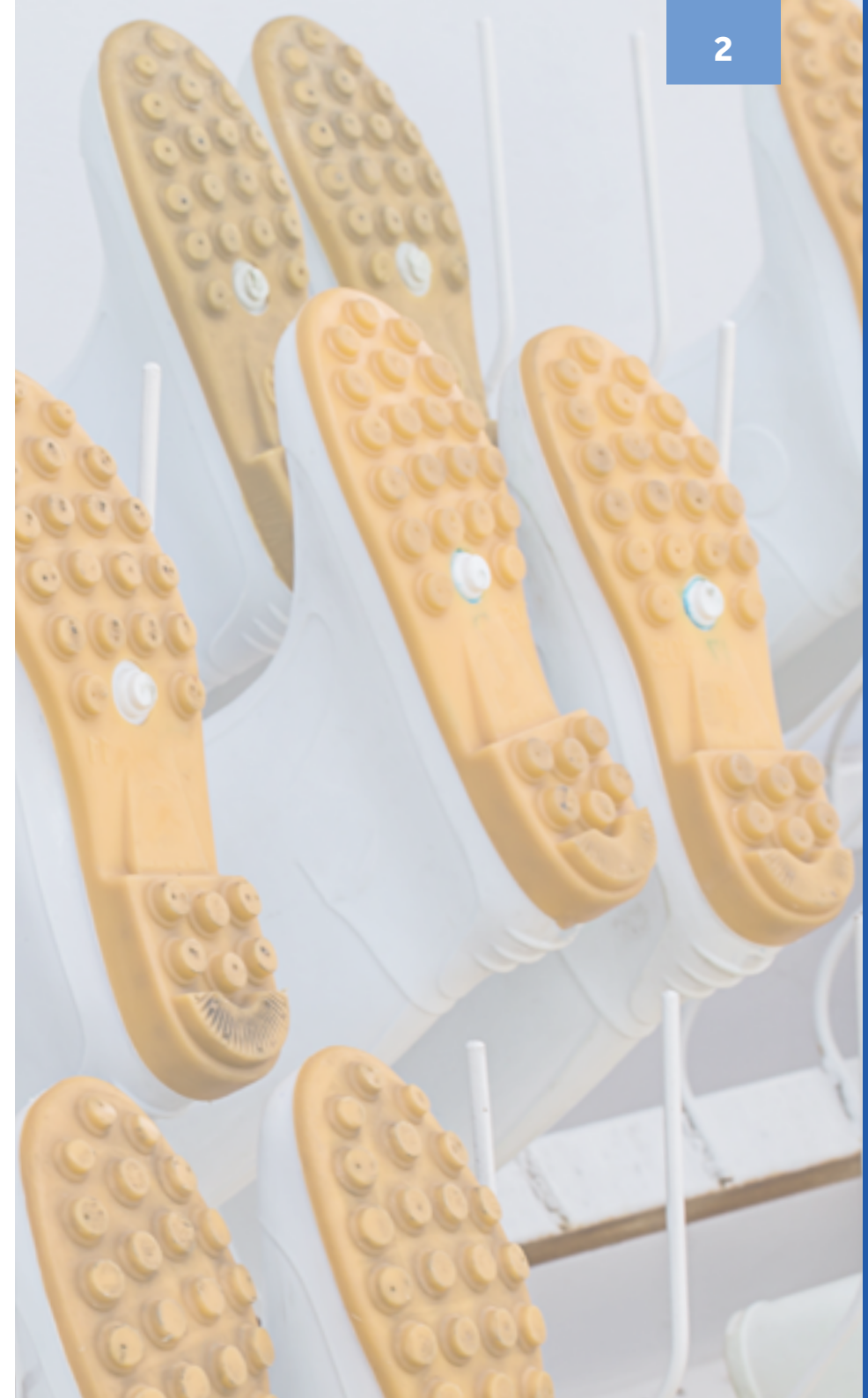
Dive deeper into footwear hygiene, truly the first step to achieving hygiene excellence at your organization.

Introduction

For food processing facilities, footwear hygiene is truly the first step for food safety. In this eBook, we explore everything you need to know about footwear hygiene: the most commonly used hygiene methods, key aspects of employee footwear to ensure effective sanitation, hygiene program considerations and some best practices for footwear hygiene at your facility.

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SECTION 1 Footwear Hygiene Methods Compared

Common Footwear Hygiene Methods Compared



Footwear hygiene is truly the first step in hygiene and a cornerstone of Sanitation Standard Operating Procedures (SSOPs). There are a few common methods used to remove debris and pathogens from footwear. Each method has its benefits, but some have crucial drawbacks that can result in pathogen spread. Here are some of the most common footwear hygiene methods used today and the pros and cons of each:

	Meets Regulatory Standards	Hygiene Event / Compliance Tracking	Convenient	Kills Pathogens	Removes Pathogens	SSOP Procedure	Throughput	Water Consumption	Solution Quantity Used	Outsourcing / Training	Safety
Manual Boot Scrubbers	🟢	🔴	🔴	🟢	🟡	🟡	🟡	🟡	🟡	🟡	🟡
Manual Boot Dips	🟢	🔴	🟡	🟢	🟡	🟡	🟢	🟡	🟡	🟢	🟡
Automated Footwear Hygiene Stations	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟡	🟡	🟢	🟡
CleanTech® Footwear Enhancements	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴
Door Foamers	🟢	🔴	🟡	🟢	🔴	🟡	🟢	🟢	🟢	🟢	🟡
Dry Quat Pellets	🟢	🔴	🟡	🟡	🔴	🟡	🟢	🟢	N/A	🟡	🔴
Tacky Mats	🟢	🔴	🟡	🟡	🔴	🟡	🟡	🟢	N/A	🟡	🟡
Booties / Shoe Covers	🟢	🔴	🟡	🟡	🔴	🟡	🔴	🟢	N/A	🟡	🟡
UV Lights	🔴	🔴	🟡	🟡	🔴	🟡	🟡	🟡	🟡	🟡	🟡

Manual Boot Scrubbers

Benefits

- Low cost

Potential Concerns

- Entirely dependent on human behavior
- Requires good cleaning required for effective footwear hygiene
- Manual scrubbing process causes a longer hygiene event per shoe
- Doesn't maintain

Manual Boot Dips

Benefits

- Faster systems for all

Potential Concerns

- Entirely dependent on human behavior
- Requires consistent application of footwear hygiene
- Requires consistency to mix the proper chemical concentration
- Maintenance means employees need to ensure enough contact time to be effective at killing pathogens

Automated Footwear Hygiene Stations

Benefits

- Removes the variability of human behavior
- Reduces human capabilities and contact design

Potential Concerns

- Floor draining required
- Some additional outsourcing is needed for use

CleanTech® Footwear Hygiene Enhancements

Benefits

- Removes the variability of human behavior
- Eliminates chemical application time and footwear in 12 seconds
- Automatic application of cleaning solution at footwear entry
- Automatic replenishment of cleaning solution

Potential Concerns

- Floor draining required
- Some additional outsourcing is needed for use
- Requires CleanTech® automated footwear hygiene station

Door Foamers

Benefits

- Easy to install for large throughput as foamers cover all shoe area

Potential Concerns

- Cannot be used for foot traffic and equipment such as forklifts
- Must be installed correctly to ensure proper coverage of footwear hygiene
- Trailing liquids to be kept separate to keep optimal concentration for footwear

Dry Quat Pellets or Powder

Benefits

- Easy to use in both wet and dry environments

Potential Concerns

- Cannot be used in wet floor conditions and parking lots
- May need some moisture to activate

Tacky Mats

Benefits

- Easy to install
- Can be used for multiple entrances

Potential Concerns

- Frequently depending on the environment
- Can be easily be replaced often
- Non-effective on pathogens

Booties / Shoe Covers

Benefits

- Easy to use
- Low maintenance cost and effort

Potential Concerns

- Not suitable for environments with any moisture
- High shoe abrasion causing a safety hazard to wear and put on

UV Lights

Benefits

- Easy to use
- No use of sanitizing chemicals

Potential Concerns

- May not be effective against all types of pathogens or other microorganisms
- Can be difficult to install and maintain
- Can require significant safety of exposed areas

A University of Arizona study determined that 96% of shoes held Coliform and E. coli bacteria. Imagine this entering your production zones. Footwear hygiene is undoubtedly one of the most important aspects of your Sanitation Standard Operating Procedures (SSOPs), but what exactly does footwear hygiene mean? As Paul Barnhill, Chief Technology Officer at Meritech explains:

“Footwear hygiene really means the ability to remove soils and debris as well as sanitize the footwear of bioburden or microbial load - or simply, to remove dirt and kill the pathogens.”

For organizations, footwear hygiene helps prevent contaminations from outside environments as well as cross-contamination within their facilities which may pose a risk to consumers. Each footwear hygiene method has its benefits but some have critical pitfalls that can result in ineffective pathogen reduction. Here are some of the most common footwear hygiene methods used today and the pros and cons of each:

← Download our comparison guide to quickly compare the top footwear hygiene methods!

Manual Boot Scrubbers

One of the more common methods of footwear sanitation, especially in wet facilities with debris, is manual boot scrubbers or washers. These can be as rudimentary as a bucket of sanitizing solution and a scrub brush or a fixed brush station where someone can manually scrape debris from their footwear. The main drawback of these manual scrubbing stations are that they are dependent on human behavior. No matter how stringent a facility's footwear hygiene procedures may be, humans are prone to variability and error that can result in a poor footwear hygiene event and increased risk of pathogen spread. Additionally this method may be a safety risk as individuals, especially older team members, try to balance on one leg while scrubbing the other foot.

Benefits:

- Low cost
- Familiar system to most

Potential Concerns:

- Entirely dependent on user behavior
- Training and retraining required for effective footwear hygiene
- Manual scrubbing process means a longer hygiene event per user
- Doesn't replenish concentration of fluid automatically
- Requires someone to mix the proper chemical concentration
- Potential safety risk of fall for users



Automated Footwear Hygiene Systems




One of the best ways to consistently remove debris and pathogens from all employee footwear is to remove the variability of human behavior from the footwear hygiene process entirely. An automated footwear hygiene station uses mechanized brushes to remove debris while also applying the proper amount of sanitizing solution on footwear to reduce the risk of pathogen spread.

Benefits:

- Removes the variability of human behavior
- Bi-directional capabilities and compact design
- Automatic application of sanitizing solution at effective PPM for footwear sanitation

Potential Concerns:

- Floor draining required
- Some additional onboarding is needed for use

 Learn more about automated footwear hygiene systems in the video [here](#).

Manual Boot Dips

Also common in wet food processing facilities are manual boot dips. While these are a low-cost footwear hygiene solution, they also require constant monitoring and maintenance to ensure an effective PPM of solution to properly sanitize footwear. If a facility has debris, these types of footwear hygiene solutions are not recommended as the debris goes nowhere and has to be removed and cleaned manually. Because it is a manual method, the main drawback of these manual boot dips are that they are dependent on human behavior. No matter how stringent a facility's footwear hygiene procedures may be, employees may not maintain effective contact time with the sanitizing solution resulting in a poor footwear hygiene event and increased risk of pathogen spread. This footwear sanitation method is placed at doorways and often is overstepped as some team members do not like stepping in them.

Benefits:

- Low cost
- Familiar system to most

Potential Concerns:

- Entirely dependent on human behavior
- Training and retraining required for effective pathogen removal
- Manual process means employees need to ensure enough contact time to be effective at killing pathogens
- Doesn't replenish concentration of fluid automatically
- Requires somebody to mix the proper chemical concentration for pathogen removal

Door Foamers

For wet production environments with large doorways, door foamers are a good option. With these, the sanitizing solution is spread across areas on a timed basis to sanitize the floor and the footwear of employees or the wheels of production equipment passing through the area. To be effective, the foam spray needs to be the correct height and calibrated to spray enough foam, often enough to ensure that worker's shoes and equipment is always sanitized without circumvention and without excessive foam causing a slip hazard. These systems are very dependent on the environment they are installed in and need to be calibrated for each situation. If there is a cross breeze or constant traffic the foam breaks down quicker and the application of more foam may be necessary.

Benefits:

- Suitable for large doorways as foamers cover a large area
- Can be used both for foot traffic and equipment such as forklifts

Potential Concerns:

- Creates a slick surface that can be a safety hazard for human traffic/employees
- If not installed correctly, it can be circumvented by human traffic
- If not installed correctly it can spray beyond the floor or footwear and onto the employee's ankles.
- Timing needs to be optimized to keep optimal concentration for traffic flow

CleanTech® Footwear Hygiene Enhancements

For CleanTech® automated handwashing stations, there are two options for footwear hygiene: the automated boot dip and the Sole Clean low moisture footwear sanitizing pan. Both systems are designed to sanitize footwear that is already clean of heavy or impacted soils. Each can be affixed to the CleanTech® Automated Handwashing Station to simultaneously clean employee footwear during a CleanTech® 12-second hand wash cycle.



Wetted Boot Dip

Designed for wet production environments this enhancement automatically maintains the correct PPM of solution. It also has a quick drain for easy cleaning and can be refilled at the push of a button.



Sole Clean Sanitizing Pan

Great for dry or semi-dry manufacturing environments, this pan uses a unique alcohol-blend sanitizing solution to effectively kill pathogens and then evaporate quickly post-application to reduce moisture accumulation.



Learn more about CleanTech® Automated Handwashing Stations and these enhancements in our webinar: *The Science Behind CleanTech®: How Automated Handwashing Stations Work*

CleanTech® Footwear Hygiene Enhancements

Benefits:

- Removes the variability of human behavior
- Simultaneously cleans employees hands and footwear in 12 seconds
- Automatic application of hygiene solution at effective PPM for pathogen removal
- Automatic replenishment of solutions

Potential Concerns:

- Floor draining required for boot dip
- Some additional onboarding is needed for use
- Requires CleanTech® automated handwashing station



Dry Quat Pellets or Powder

A very visible method of footwear hygiene that can be used in both wet and dry environments is dry quat pellets or powder. By clinging to shoes or wheels, this material helps sanitize the footwear of employees and equipment. However it does get everywhere in the facility, so additional precautions need to be taken if your facility is “vertical” or has catwalks above production zones to prevent the Quat pellets from falling and creating a potential contamination risk to products below.

Benefits:

- Clings to footwear
- Can be used in both wet and dry environments

Potential Concerns:

- Pellets are tracked everywhere
- Pose significant risk to food and employee safety
- Cannot be used in vertical facilities as pellets can fall onto production lines
- May need some moisture to activate

Tacky Mats

Another footwear hygiene method that is suitable for dry environments is tacky mats. Often used in cleanroom environments, these mats will remove particulates from employee shoes, but perform no sanitation of the footwear and don't kill any pathogens. These mats should not be used with heavy debris as they can easily become compromised depending on the soil levels. These mats also require human intervention to be changed on a regular basis to be an effective hygiene method.

Benefits:

- Can be used with all footwear types
- Removes small particles and dust
- Easy to install
- Can be used for multiple entrances

Potential Concerns:

- Only suitable for dry environments
- Performs no sanitation of footwear / kills no pathogens
- High maintenance - Needs to be changed out frequently depending on volume of personnel and soil levels
- Can be costly to replace often
- Not effective on pathogens

Booties / Shoe Covers

Many dry production environments also use booties or shoe covers before or after another footwear hygiene method, like tacky mats. These covers do not sanitize the footwear, only protecting the production environments from particulates, not pathogens. These can be used with all types of footwear and are easily used by all, but do pose a safety hazard as they make footwear slippery and can be costly if facilities are replacing them often for large numbers of employees.

Benefits:

- Easy to use
- No use of sanitizing chemicals
- Low maintenance cost and effort

Potential Concerns:

- Don't protect from pathogens, just particulates
- Can be costly to replace often
- Can cause significant waste if replaced often
- Not suitable for environments with any moisture
- Makes shoes slippery, causing a safety hazard to wear and put on

UV Lights

A new method of footwear hygiene is UV lights. While these lights claim to sanitize footwear, not much evidence exists to prove their efficacy against a broad spectrum of pathogens. UV lights also take a significant amount of time to sanitize the footwear, which may be inefficient for high throughput areas that need to quickly sanitize large amounts of employee footwear. To date, there has not been any regulatory approval accepting this method for footwear hygiene in food manufacturing.

Benefits:

- Easy to use
- No use of sanitizing chemicals

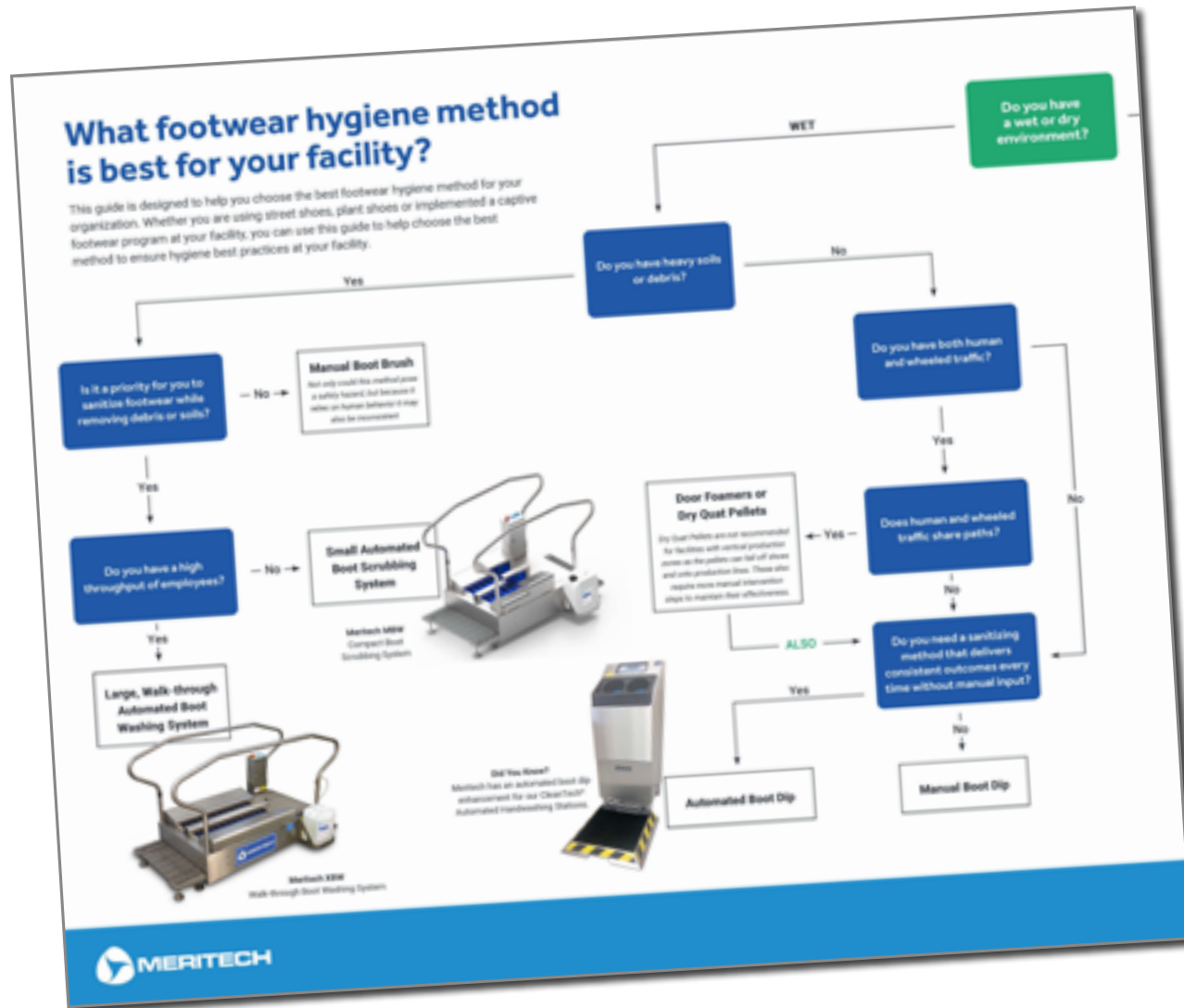
Potential Concerns:

- Unproven technology not currently used in many applications.
- Needing regulatory buy in prior to use.
- Not effective against pathogens when any debris / soils exist
- May not be effective against a broad spectrum of pathogens for shorter time periods
- Not ideal for large shifts as it takes a long exposure time to properly sanitize footwear
- Lacking peer reviewed efficacy data



SECTION 2 **Considerations when
Choosing a Footwear
Hygiene Method**

To choose the best footwear hygiene method for their organization, leadership needs to not only consider food safety best practices but also ask themselves:



Do we have a wet or dry facility?

One of the first considerations for any facility when choosing a footwear hygiene method is whether they are producing products within a wet or dry environment. For dry plants, footwear sanitation options are a bit more limited as most methods rely on liquid solutions and water to rinse and sanitize footwear. To protect product integrity, dry plants need a low-moisture footwear sanitation method and should consider plant shoes to prevent excess debris from entering the plant and overwhelming tacky mats. For wet plants, more debris removal options are available, but there is also added risk of slip hazards so it's important when implementing a footwear hygiene program that all boots or shoes are slip resistant.

← Using a few short questions, our guide helps you choose the best footwear hygiene method for your facility. [Download it now!](#)

What are we trying to control?

When implementing a footwear hygiene program, it's important to take a high level approach and simply ask - what are we trying to control? If your facility is in packaging or produce you may have heavy soils that will require some sort of boot scrubber to ensure debris removal. For products that contain nuts, dairy or other allergens, how will you protect consumers from these if employees are moving between production areas? Are you concerned about pathogen removal? A ready-to-eat facility may be especially concerned with this as these products are going to be directly consumed. Considering what you are producing and if you need to remove soils or if you need to kill pathogens is key when choosing a footwear hygiene method for your facility.

What is our budget?

When you start searching for the right footwear hygiene method for your facility, it is important to consider initial and ongoing costs. If a facility has lots of visitors, disposable hygiene methods such as shoe covers or tacky mats may wear out quickly and need to be replaced often. Additionally, if there is high turnover or seasonality to workers, a captive footwear program where the company supplies employees with plant shoes may not be economical.



How is the facility designed?

Choosing the right footwear hygiene method for your facility is really about monitoring traffic patterns in the facility and determining exactly what methods will work in each area to maintain traffic flow while also preventing circumvention of hygiene steps. It is especially important to monitor and consider:

Multiple Entrances

If a facility has multiple entrances there needs to be a hygiene intervention step at each entrance to the facility to make certain that no one can enter production areas without sanitizing their footwear first.

Traffic Patterns

Another consideration is how employees move throughout the facility during the day. Are they moving between different production zones or going from break areas back to production areas without a footwear hygiene intervention step? When looking at traffic patterns the products that are being produced need to be also considered. If an employee is moving from a raw to an RTE area or if they are moving from an allergen to a non-allergen area.

Traffic Types

Not only is it important to consider the path that employees take throughout the day within a facility but also if they share that path with other equipment such as forklifts. If so, door foamers or dry quat pellets should also be used in those areas to prevent pathogens from the wheels of equipment from entering production zones or contaminating employee footwear.

Vertical Facilities

How footwear is sanitized is key when building a footwear hygiene program for a facility with multiple levels or catwalks near production areas. If a facility has multiple levels, it is key that excess sanitizer or dry quat pellets are not used as these can fall or drip off of footwear and compromise the product below.

Hygiene Zones

Even the layout of hygiene zones throughout the facility should be considered. If space is limited, a large footwear hygiene method such as a walk-through automated boot washing system may not be ideal. Additionally, it is key that these areas make it easy for individuals to change into and store footwear, especially when using plant shoes or employing a captive footwear program. Anytime an employee is changing footwear, shoe covers, etc. there should be a hand hygiene step post-donning footwear.



SECTION 3 Footwear
Types and
Considerations

Not only is the hygiene method a key part of any footwear hygiene program, but the type of footwear used at your facility can also directly impact food safety. There are three main types of footwear that are used at food processing and packaging facilities:



Street Shoes

Any shoe that is worn both inside and outside the plant



“Captive” or “Zoned” Footwear

A subcategory of plant shoes where footwear is designated to a certain zone in the plant



Plant Shoes

Any shoe that is worn inside the plant only

For employees, footwear is a very personal decision. Employees are usually on their feet most of the day so your facility’s choice in footwear is truly the difference between comfort or pain for your team. Because of this, many organizations choose to give employees freedom to purchase their own plant or street shoes to wear at the facility or may offer many options or types of footwear that may have different look, slip resistance or more importantly a different hygienic design. However, there are some key considerations that companies or employees should take into account when choosing footwear to maintain food safety and hygiene excellence at their facility:

Hygienic Design

The most important aspect when choosing the type of footwear for use at your facility is its ability to be cleaned and sanitized. There are several key aspects to consider for this including:

Footwear Material

It is key that the material of the footwear can withstand heavy scrubbing and exposure to sanitizing chemicals. Some plastics and rubbers can degrade quickly due to sanitizer incompatibility and other materials like leather and canvas can actually absorb more pathogens, posing an even greater risk to food safety.

Footwear Height

When employing a footwear sanitation method like boot scrubbers at your facility, the height of employee's footwear is key. Brushes can range from 3-9 inches in height so employees need to have an ankle-high, mid-calf or a full boot that exceeds the height of brushes used.

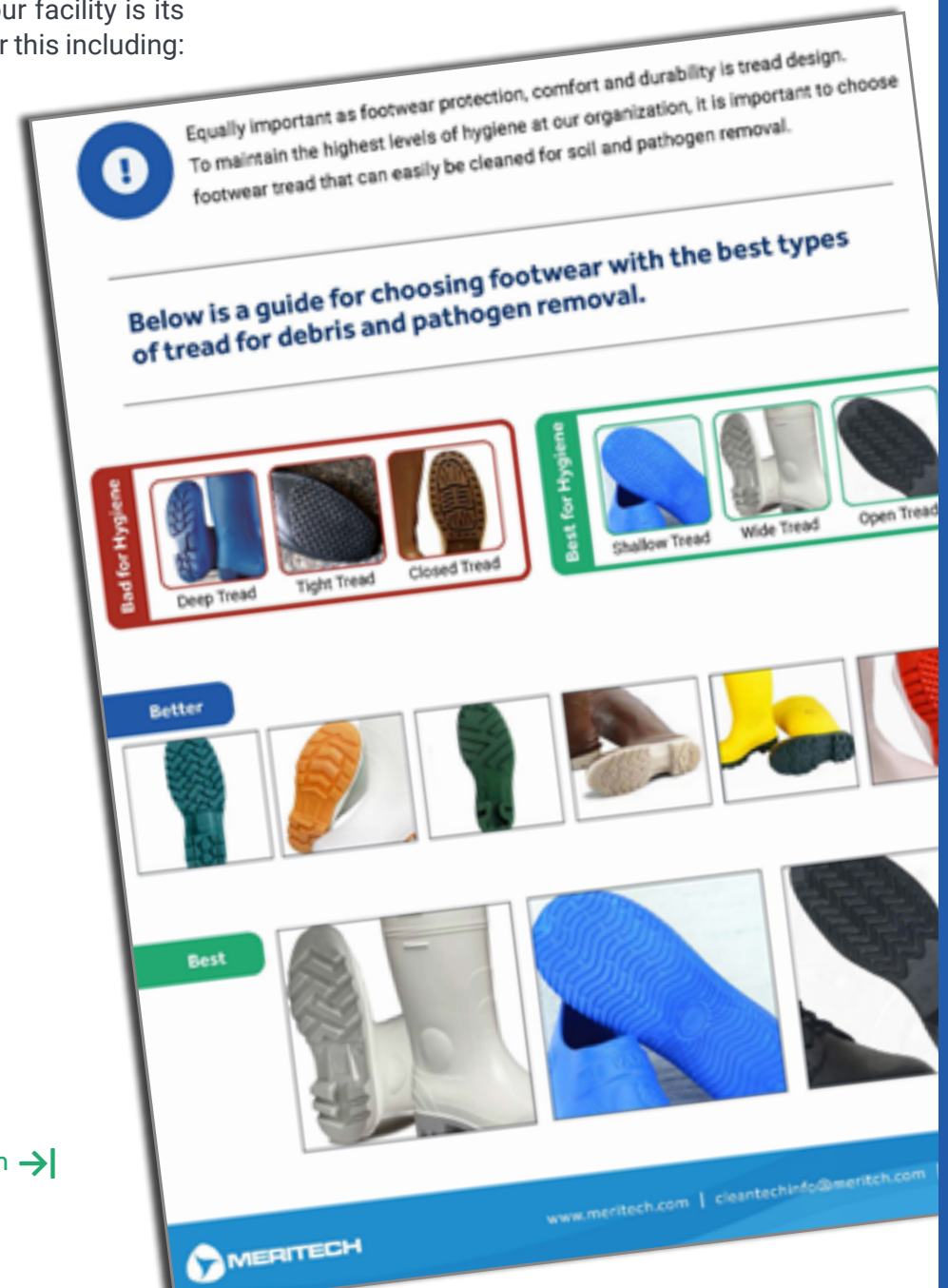
Footwear Laces

Laces are common on most footwear but actually pose both a safety and contamination risk. If laces are not made out of a material that prevents saturation or absorption of fluids or chemicals, they can easily absorb and spread chemicals or pathogens throughout the facility. Untied laces also pose a slip hazard as well as a cross contamination hazard when employees re-tie them throughout the day.

Footwear Tread

Footwear that has shallow tread which is open to the sides of the footwear can be easily cleaned of debris and sanitized. Tight, closed tread increases the likelihood of impacted soils and prevents the footwear from being properly sanitized, posing a significant risk of contamination from outside debris or between production areas.

Download the footwear guide in both English and Spanish to help team →
members pick shoes that uphold your facility's hygiene standards



Fit and Comfort

Undoubtedly the most important aspect of footwear for your team is the fit and comfort of the boot or shoe they will be wearing. Employees need comfortable footwear with lots of cushion for standing during 8+ hour shifts. Footwear also needs to fit well, as footwear which is too tight or loose will cause blisters, discomfort and even pose a safety hazard. For comfort, also consider your organization's production area. If it is a cold environment consider footwear with added insulation, for warm environments a more breathable material may be best.

Safety

Footwear is the foundation of your team's safety throughout their workday as they move about your facility and the following should be considered to protect them:

Steel Toe

If heavy equipment is being used or they are carrying materials that could be dropped, steel toed footwear should be required to further protect employees that are handling or working around heavy machinery.

Tread Design and Material

Especially important in wet facilities, the bottom of the footwear should be made out of non-slip material that has good tread to ensure that employees do not slip and fall on wet surfaces.

Laces

Untied laces can easily cause a trip hazard or be caught in equipment, so some facilities may wish to avoid this safety risk altogether.





SECTION

4

**Footwear
Hygiene Best
Practices**

To achieve hygiene excellence at your organization, consider some of these best practices for footwear hygiene:

Employ a Captive Footwear Program

A captive footwear program is truly the precipice of great footwear hygiene practices at any organization, especially those dealing with allergens or ready-to-eat foods. With this program, the footwear stays in one particular area of the plant ensuring zero cross-contamination between high and low risk production areas and provides the ultimate safety for your consumers. However, there are some key aspects to consider before starting this program:

Cost

While it is the gold standard for footwear hygiene, a captive footwear program also comes with significant initial and upkeep costs, especially if employers are providing the footwear to employees. Not only will the employer need to purchase all footwear at the start of this program, but will also need to replace worn out footwear throughout the year and provide footwear for any new hires.

Environment

How many different types of footwear are needed for a captive footwear program really depends on the people, place and products of the organization. Realistically each facility could need over six different types of footwear depending on the area (e.g. cold, wet, or allergen) as well as for the different groups of people and the processes they're conducting (e.g. maintenance, sanitation, and auditors or visitors).

Hygienic Process

Where footwear is cleaned or sanitized in the facility is just as important. These areas need to be able to accommodate both employees and the extra storage space needed for a captive footwear program.

Hygienic Design

As mentioned earlier, the design of footwear itself is crucial. How easy a footwear is cleaned or sanitized is the foundation for any footwear program, including a captive one.

Employ a Captive Footwear Program

Comfort

Comfort is what employees care about most. If an employer is providing the shoes or boots for a captive footwear program, they need to ensure that the purchased shoes are comfortable for employees during long shifts.

Storage

Storage is a crucial aspect of a captive footwear program. Whether they are shared, stored dirty or clean, and where they are stored such as in a locker or drying rack should all be taken into account.

Safety

Is the shoe protecting employees from their working environment? Footwear should protect employees from cold temperatures, drop risks, slip risks and moisture.

Onboarding / Offboarding

Who maintains ownership of the footwear is key in a captive footwear program. If the employer is keeping the footwear after an employee leaves the company, how is the footwear deodorized and cleaned for the next employee? Is it even the right size? These are especially important if the organization uses a lot of contract or temporary labor.



Learn more about considerations for a captive footwear program and how to begin implementing one at your facility in our podcast!



Training and Retraining

Training team members on footwear hygiene procedures once and then not reinforcing those correct hygiene steps throughout the year is nearly as bad as not training them at all. Leadership needs to continually reinforce good behaviors and keep footwear part of the conversation in order to ensure a successful hygiene program. Communicating best practices as well as the importance of footwear hygiene for food safety during huddle talks and safety days periodically throughout the year is key to program success. Additionally having signage for cleaning steps or when footwear needs to be changed for hygienic zoning is crucial.

Create a Culture of Footwear Hygiene

One of the best ways to make certain footwear hygiene standards are being met is to make each employee accountable for hygiene excellence at your organization. By creating a culture of hygiene excellence you encourage each person to think like an owner and uphold their own personal footwear hygiene standards to guarantee food safety. This includes encouraging them to stay aware of contamination points, always performing the proper footwear hygiene steps, maintaining their footwear and monitoring and advising leadership if footwear hygiene stations need maintenance.

 Check out our blog to learn more about creating a hygiene culture at your facility!



Reduce Risk with Automation

Another way to make certain that team members always sanitize footwear correctly is to have it automatically done for them with an automated footwear hygiene system. There are several automated methods from walk-through boot washing systems, to compact individual boot scrubbers and even sanitizing pans that can be attached to automated handwashing stations to sanitize feet and hands at the same time. Each of these uses automation to remove the variability of human behavior from the hygiene process so footwear is always sanitized the correct way, for the correct length of time to ensure debris and pathogen removal.



Conclusion

Overall, effective footwear hygiene is the first step of hygiene best practices and key to preventing contamination from debris, pathogens and allergens. Understanding your people, place and product is the first step in creating a footwear hygiene program at your facility. Equipping employees with easily cleaned footwear, employing a good hygiene method and building out a hygiene culture are just some of the steps you can take to ensure your program achieves footwear hygiene excellence. Learn more footwear hygiene tips and get useful guides and tools to share with your team at [Meritech's hygiene resource center](#).





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