

Implementing 5S in the Food Industry

AMIT KHERADIA, EDUCATION AND TECHNICAL SUPPORT MANAGER, REMCO
 DEBRA SMITH, GLOBAL HYGIENE SPECIALIST, VIKAN A/S

INTRODUCTION TO 5S

5S is a popular workplace organisation method that can help any company to systematically create a safe, clean, and structured workspace. First developed and implemented in post-war Japan by the Toyota Motor Company, 5S became a key element in lean manufacturing.

The 5S Elements are typically as follows:

Japanese name	5S Element	Short description
整理 Seiri	SORT "Everything has a purpose"	Select what's needed for the job and remove everything else from the work area.
整頓 Seiton	SET IN ORDER "Everything has its place"	Arrange items so that they are easy to select, use, and return to their proper location.
清掃 Seiso	SHINE "Everything is clean and well-maintained"	Spot dirty, non-conforming items and then clean, repair, or remove them from service.
清潔 Seiketsu	STANDARDISE "Every action is well-known and clearly stated"	Develop and implement visual standards that employees are able to consistently follow.
躰 Shitsuke	SUSTAIN "Every action is replicated and improved upon"	Create an improvement culture among employees so they can find better ways of reducing efforts.

Note: At some sites, SAFETY (of employees) and SECURITY (of infrastructural systems) may be added to the 5S workplace organisational strategy.

BENEFITS OF 5S TO THE FOOD INDUSTRY

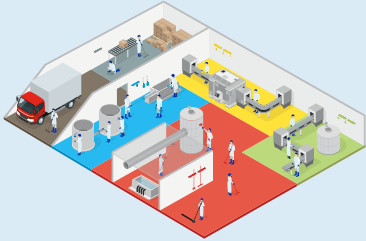
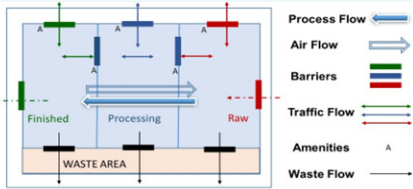

Specifically, within the food industry, 5S principles can be used to promote food safety and quality by preventing, or significantly minimising, contamination incidents that may influence the safety, legality, and integrity of food products that are manufactured, held, or transported.

The primary benefit of 5S in the food industry is that it promotes the food safety management system (FSMS): It is reported that more than 85% of the food safety issues that occur on a site are caused by failures in GMPs (including environmental hygiene), rather than failures in the HACCP plan. Consequently, 5S has gained prominence industry-wide as a way to improve compliance with the FSMS, food safety regulations, food safety and quality standards, and customer requirements.

Examples of how each 5S element can help reduce failures in environmental hygiene GMPs are shown below.

5S Element	Short Description	Examples of how 5S element can help reduce failures in environmental hygiene GMPs
SORT	Select what's needed for the job and remove everything else from the work area.	Select cleaning tools and utensils that are 'fit for purpose' for each area and function. Consider efficacy, durability, food-contact compliance, hygienic design, ergonomics, colour, etc.
SET IN ORDER	Arrange items so that it's easy to select, use, and return them to their proper location.	Store cleaning tools and utensils on well-stationed, colour-matched wall brackets and/or shadow boards. This will enable tools to be found quickly and easily for use; ensure that they are returned to the right place after use; and help minimise tool damage and the risk of food product cross-contamination.
SHINE	Spot dirty, non-conforming items and then clean, repair, or remove them from service.	Develop a cleaning tool and utensil maintenance programme that includes tool cleaning and disinfection (methods and frequency - as appropriate based on risk assessment), and regular tool inspection and replacement.
STANDARDISE	Develop and implement visual standards that employees are able to consistently follow.	Use colour-matched wall brackets or shadow boards so that staff can easily see which tools go where. Shadow boards also provide a coloured 'shadow' of each tools so that staff can easily see exactly what is stored where.
SUSTAIN	Create an improvement culture among employees so they can find better ways of reducing efforts.	Train employees in 5S principles and in the GMP measures put in place to support them. Encourage staff suggestions for further improvements.

5S can also work as a foundation to improve food safety programs, as shown below:

Food Safety Best Practice	5S Element(s)	Typical 5S Application
<p>Hygienic Zoning & Environmental Monitoring</p> 	<ul style="list-style-type: none"> • Sort • Set-in-order • Standardise • Sustain 	<p>Allocating separate employees, tools, uniforms, and other resources to distinct hygienic zones: e.g. pathogen control areas and allergen zones; and monitoring the hygienic and sanitary conditions of these zones.</p>
<p>Operational Flow Management</p> 	<ul style="list-style-type: none"> • Sort • Set-in-order • Standardise 	<p>To adequately control the process flow (from receiving to shipping), including the movement of air, people and equipment, and waste, at the operational level, the site may justifiably place barriers or provide tools/facilities that minimise the risk of food contamination or help avoid any serious accidents within the facility.</p>
<p>Control of Food Safety and Quality Hazards</p> <ul style="list-style-type: none"> ✓ BIOLOGICAL ✓ CHEMICAL ✓ PHYSICAL ✓ OTHER ISSUES 	<ul style="list-style-type: none"> • Sort • Set-in-order • Shine • Standardise • Sustain 	<p>5S strategies may be applied as preventative measures within GMP or HACCP programs to control the survival, growth, and/or spread of contaminants that may adversely affect food safety and quality. Key food safety hazards are: microbes, allergens, and foreign material.</p>
<p>Hygienic Design Principles</p> 	<ul style="list-style-type: none"> • Shine • Standardise • Sustain 	<p>Food facilities that have hygiene critical / high risk areas (where foods are processed, packed, or ready-to-eat foods are manufactured) should consider investing in hygienically designed facility fixtures, equipment, and tools, which are easier to clean, disinfect, and maintain, than their conventional counterparts.</p>

Colour-Coding Program implementation

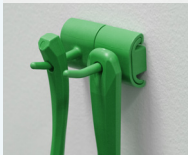


- Sort
- Set-in-order
- Standardise

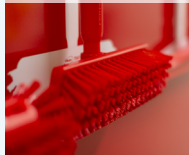
Colour-coding promotes the idea of a “visual factory” that makes it easy for any employee to find the right tool at the right time. This can minimise the risk of product cross-contamination, for example, by having a different tool colour for those used in contact with food and food contact surfaces and those used to clean floors and drains.

Storage

Wall brackets



Shadow boards



- Sort
- Set-in-order
- Standardise
- Sustain

Wall brackets and shadow boards are an essential component of an effective and hygienic tool management program. Effective (colour-coded) storage of cleaning tools can help ensure that tools are always in the right place at the right time, reducing labour costs. Tool storage systems can also prevent tools from being stored on the floor where they are more likely to become contaminated, damaged, or pose a trip hazard.

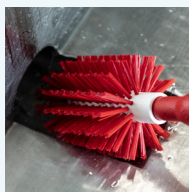
Zone plan



- Sort
- Set-in-order
- Standardise
- Sustain

A zone plan will provide an overview of your site, divided into different coloured zones, dependent on your requirements. It will also provide you with lists of which tools are used where, and the ability to print this information for use in audits. Zone plans help employees take ownership of the tools in their zone by helping them ensure that only the allocated tools are used.

Cleaning, disinfection and maintenance



- Shine
- Sustain

Regular cleaning, disinfection, and maintenance of all equipment and surfaces, as appropriate, is a critical part of Shine and Sustain within 5S. This includes the cleaning, disinfection, and maintenance of cleaning tools, which should be conducted at a level and frequency, as determined through risk assessment, to ensure the maintenance of a hygienic production environment.

EXAMPLES OF FOOD MANUFACTURING HYGIENE CHALLENGES AND RELEVANT 5S RECOMMENDATIONS

Scenario #1:



Manufacturer “A” mills various types of grain, including some that are gluten-free. Gluten is a notifiable allergen and the mill packs milled gluten-free products labeled as ‘Gluten-free’ to send to their customers. Cross-contamination of the gluten-free product with gluten is a food safety risk and must be prevented by European law if the gluten-free packed products are declared as ‘Gluten-free’ on the label.

Potential Hygiene Challenges:

- Tools for cleaning equipment and floors look the same, and cannot be separately identified.
- Cleaning tools for food-contact and non-food contact surfaces are mixed together.
- There are no designated stations, racks, or shadow boards to store tools properly.
- Tools for handling products containing gluten and for cleaning surfaces contaminated with gluten are not separated from those used for gluten-free products and cleaning.
- There is no tool cleaning and maintenance schedule, or tool replacement schedule.

5S Recommendations:

Sort- Use colour-coded tools and zones to identify and separate food-contact from non-food contact tools.

Set-in-order- Ensure tools are in their designated hygienic zones, and any movement is monitored.

Set-in-order- Designate storage racks, wall brackets, or shadow boards at each zone to ensure tools are properly separated and stored.

Standardise- Define the tools used for allergen (gluten) cleaning or handling through distinct colour-coding.

Sustain- Maintain process improvements through a proper tool cleaning, maintenance, and replacement program.

Scenario #2:



The operations and maintenance department in a confectionery manufacturing facility is facing big issues with product contamination due to plastic brush bristles in their molten chocolate.

Potential Hygiene Challenges:

- Risk of foreign material contamination from poor quality or damaged cleaning brushes.
- Absence of proper storage stations for cleaning brushes leading to damage
- Use of brown brushes means that bristle contamination is not easy to see in the brown chocolate product.
- Lack of awareness among staff about the benefits of good quality, hygienically designed tools.
- Absence of a good brush inspection and replacement schedule.

5S Recommendations:

Shine- Remove all sub-standard and damaged brushes from production. Replace with high-quality, durable brushes and employ a regular brush inspection and replacement programme.

Set-in-order- Provide adequate brush storage facilities (wall brackets or shadow boards) to minimise the risk of brush damage and contamination.

Standardise- Define the brush selection process (in terms of hygienic design, colour-coding, etc.).

Sustain- Maintain process improvements created by the 5S plan with a proper tool inspection, maintenance, and replacement program.

Sort- Select cleaning tools and utensils of a contrasting colour to the chocolate to aid visual detection of plastic foreign bodies.

5S AND LEAN ENTERPRISE

An important secondary benefit of 5S to the food industry is that it is a great starting point for creating a Lean Enterprise. All organisations should continually strive to improve operational efficiencies by minimising waste and creating value for their customers. The 7 most common types of wastes identified within a food production facility are as follows:

Type of Waste	Typical waste Example within a Food Facility	How to Potentially Resolve the Issue in a Lean Enterprise
Transportation	Time wasted looking for cleaning tools or utensils that are not where they should be; or retrieving/replacing tools stored remotely from where they are used.	Install colour-coded storage stations, like shadow boards or wall brackets, which (in combination with staff training) will encourage the replacement of the correct tools after use; place these storage stations in areas close to where the tools are used.
Inventory	Time wasted because the right tool for the job is not available.	Select cleaning tools and utensils that are 'fit for purpose' for each area and function. Consider efficacy, food-contact compliance, hygienic design, ergonomics and colour. Ensure stock of replacement tools for immediate replacement of missing, worn or damaged ones.
Motion	User fatigue/time wasted due to poor tool ergonomics and/or functionality.	Select cleaning tools and utensils that are 'fit for purpose' for each area and function. Consider ergonomics and efficacy, e.g., cleaning tools with telescopic handles for high level cleaning; or those that can reach under low level or the undersides of fixed equipment without the need for the operator to kneel on the floor.
Waiting	Production time lost due to inefficient cleaning - delays due to insufficient cleaning resources	Appropriate scheduling of cleaning operations, and adequate availability of trained hygiene staff and the correct cleaning tools and chemicals.
Over-production	Increased cost due to ordering and storage of inappropriate cleaning tools and chemicals, and use of too many hygiene staff.	Select cleaning tools and chemicals that are appropriate for each tasks. Use trained hygiene staff.
Over-processing	Production time lost due to inefficient cleaning - using more effort and resources than required.	Appropriate scheduling and undertaking of cleaning operations by trained hygiene staff.
Defects	Increased food product waste due to contamination from inappropriate, broken, worn, or badly designed cleaning tools and utensils; or due to poor cleaning of food production environment/equipment using inappropriate, broken, worn or badly designed cleaning tools and utensils.	Select cleaning tools and utensils that are 'fit for purpose' for each area and function. Consider efficacy, food-contact compliance, hygienic design, and colour. Regularly inspect tools and replace as required.

Note: The different types of wastes encountered and removed within a Lean Enterprise may be remembered through the acronym: "TIMWOOD."

Other advantages of implementing 5S in a food production facility include:

1. Supporting company-wide integration of work processes through the participation of all employees.
2. Raising workers' morale and motivation through their hands-on participation.
3. Streamlining processes and reduce operating costs.
4. Engaging all employees by having them help create a safer and more sustainable workplace.
5. Creating a stable foundation for the systematic implementation of lean manufacturing practices that are required to reduce wastes and inconsistencies, and thus promote value-added work.

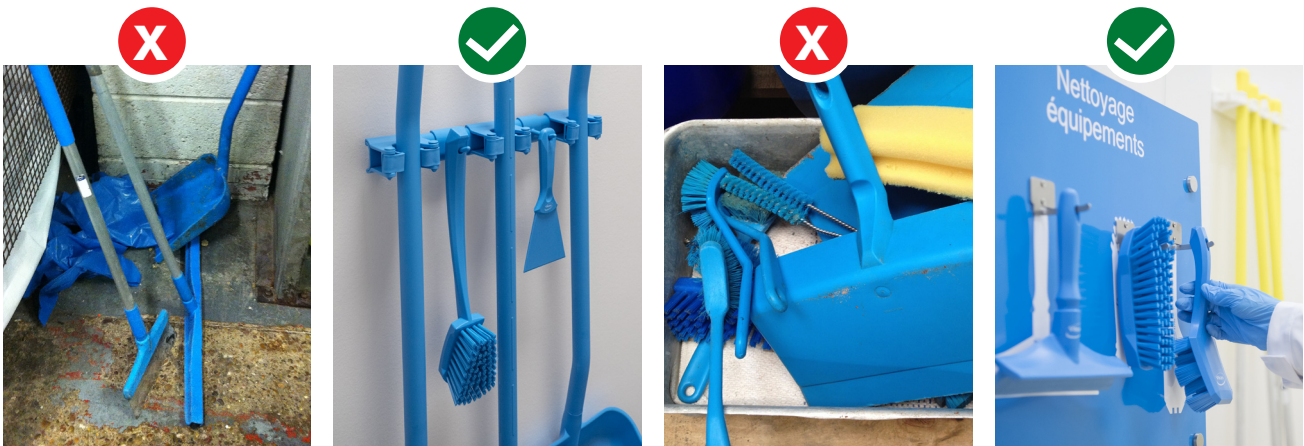
Key Critical Points	Some Focus Questions
(a) Set the 5S Scope	<ul style="list-style-type: none"> • Does the facility want to focus on improving GMP food safety and sanitation practices? • Does the site also want to lower operational costs by reducing wastes? • Does the facility want to improve on operational efficiencies, thus enhancing the value of processes? • Does the site want to lower environmental impacts, and promote the health and safety of employees?
(b) Get Management and Employee Commitment	<ul style="list-style-type: none"> • Are managers and all the employees on the same wavelength when it comes to implementing 5S? • Will they be able to continually sustain the 5S program? • Is employee education and training documented and reviewed?
(c) Educate and Train Staff on 5S	<ul style="list-style-type: none"> • Do all employees know their own role in the 5S program? • Are employees made aware of, trained on, and refreshed before any changes are made to the program? • Is employee education and training documented and reviewed?
(d) Review 5S Improvements	<ul style="list-style-type: none"> • Do employees frequently meet for, say, 10-15 minutes, to discuss 5S improvement suggestions? • Does the management team support improvement initiatives

TYPICAL STEPS TO SETTING UP 5S WITHIN A FOOD FACILITY

1. Form a 5S improvement team and identify a 5S team leader who will represent members from each department or division.
2. Divide the facility into manageable zones, which may be based on process steps, hygiene or sanitation requirements, or other departmental activity.

3. Set clear expectations of 5S methodology for each of the zones using a simple 5S checklist. This can cover facilities, equipment, tools, and even the movement of people working in an area.
4. Train and designate a person or a group responsible for implementing 5S within each of the allocated zones. Remember 5S is an every day, every moment activity.

It is generally preferable to visually note the “Before State” and “After State” expectations at each zone:



5. Set a frequency of a 5S implementation and review meeting. This may be done weekly, monthly, or quarterly based on zone risk and departments’ expectations. Remember the 5S review should be done by someone who is not responsible for implementing 5S in that particular zone.
6. 5S implementers should complete the 5S checklist at scheduled intervals, which will then be verified by the reviewers.
7. The reviewed 5S checklist will then be discussed by the 5S team to deliberate on any fixes, corrective actions, or improvements required in zonal 5S programs. The outcomes from these meetings should be well-documented.
8. Set a future date for a 5S implementation and review audit for each of the zones.

Note: The “5S Your Tools” audit checklist on the next page is a sample template that can be used to make tool management improvements within a food facility. However, please note, the checklist may vary from facility to facility, and from program to program based on the site and the program’s requirements.

SAMPLE: "5S YOUR TOOLS" AUDIT CHECKLIST

ZONE: _____ Audited by: _____ Date: _____

STEP 1: SORT		✓	✗	COMMENTS
1	Are broken/damaged/non-conforming tools removed from the area?			
2	Are food-contact tools identifiable from non-food contact tools?			
3	Are selected tools compliant with regulations and operational use?			
Sort Score		___ out of 3		
STEP 2: SET IN ORDER		✓	✗	COMMENTS
4	When not in use, are tools well-mounted on a rack or shadow board?			
5	Are tools stored at least 20 inches off ground, with their heads down?			
6	Is tool storage supported by colour-coding or any identification scheme?			
7	Are tool heads and handles apart from each other to avoid cross-contamination?			
8	Are tools in service stored away from new tools?			
9	Are there adequate tools and stations in the area?			
Set-in-order Score		___ out of 6		
STEP 3: SHINE		✓	✗	COMMENTS
10	Is there a tool sticker removal and visual tool inspection program?			
11	Are tools cleaned before and after use?			
12	Is there a documented and implementable tool cleaning program?			
13	Are storage racks regularly cleaned and disinfected, as appropriate?			
14	Are current tools hygienically designed, and thus easily cleanable?			
15	Are tools durable enough to meet cleaning and operational challenges?			
Shine Score		___ out of 6		
STEP 4: STANDARDISE		✓	✗	COMMENTS
16	Are threads and other distinct features of tools standardised?			
17	Are tools sourced to one vendor?			
18	Is there a well-identified traceability or colour-coding program?			
19	Are the tool storage, cleaning, selection, and maintenance processes consistent?			
20	Are tools in their respective hygienic/risk/allocated zones?			
Standardise Score		___ out of 5		

STEP 5: SUSTAIN		✓	✗	COMMENTS
21	Has the team addressed 5S of tools in previous audits?			
22	Is there an adequate inventory of spare tools at the site?			
23	Is there an Improvement team on tool selection, storage, and maintenance?			
24	Are tools ergonomically designed so that employees can use them?			
25	Are all employees regularly trained on 5S tool management program?			
Sustain Score		___ out of 5		

TOTAL SCORE: _____ OUT OF 25

PREVIOUS SCORE: (Date _____): _____ OUT OF 25

Opportunities for Improvement: _____

Verified by: _____

Date: _____

Next 5S Sceduled Date: _____

HOW VIKAN CAN HELP

Vikan provides specialised solutions and products including colour-coded tools for cleaning and material handling where hygiene and safety are critical. We are global leader's in the supply of hygienically designed products with a vast wealth of knowledge. Our extensive experience and focus on hygienic design strengthens our ability to provide comprehensive solutions to the food industry. We can help you with the proper selection, storage and maintenance of tools and equipment, as well as with solutions that can help companies in improving their 5S programs, and thus minimise product contamination incidences within the food plant.

Our library of white papers and articles are designed to help you find the right solutions to your food safety challenges and are available at our [Vikan Download Center](#). To learn more about programs that support 5S implementation, please read the following:

1. [Guidance on the use of Colour-Coding to improve food safety and quality](#)
2. [Optimising Food Safety Through Good Cleaning Tool Maintenance](#)
3. [Optimise your allergen control through use of colour](#)

By making information on the latest safety news, regulations, and best practices accessible via our social media and our website, we hope to provide the industry with the support it needs to keep up with ever-changing regulations and safety improvements. If you require any technical assistance and additional information about our products and services, kindly contact us at export@vikan.com

GLOSSARY

5S: Japanese-based model for increasing operational efficiency within processes through workplace organisation methods. The strategy can also be used for improving food safety and quality operations in plants.

Colour-Coding: A visualisation strategy that may act as a control measure to assist in minimising product contamination issues. It helps employees identify, separate, and control the flow of tools within the plant zones, e.g., red tools stay in the raw ingredients handling zone, and blue tools are used in the cooked product zones.

Environmental Monitoring: Systematic sampling and analysis of the production environment for microbiological (or other) contaminant to help detect hazards, inform risks assessments and develop of hygiene programmes. This must not be confused with product testing.

GMP: Also called Good Manufacturing Practices, these are basic foundational programs that help meet food safety, quality, and legal requirements.

HACCP: A systematic preventive approach of identifying, evaluating, and controlling food safety hazards (biological, chemical, and physical) through prevention, elimination, or minimisation of these identified hazards to an acceptable level.

Hazard Control: Prevention, elimination, or minimisation of food safety hazards to an acceptable level. Major food safety hazards are microbes, allergens, and foreign material.

Hygienic Zoning: A risk-based concept of separating facility areas or processes into distinct zones in order to prevent or greatly minimise incidents of product contamination or occurrences of unhygienic conditions. Note that process flow and its associated elements can influence the hygienic zoning approach.

Lean Enterprise: A continuously improving organisation that focuses on minimising waste and creating value for their customers. A food plant can become a lean enterprise if it starts with implementing a working 5S program.

Process Flow: The dynamic sequence of operational steps (from receiving, holding, processing, packing, and shipping) required to transform inputs from suppliers into an output for customers. Flow of processes may be influenced by the materials (raw, while in production (WIP), finished), traffic flow (of people and items), and flow of air, wastes, and water, etc.

Hygienic Design: The characteristic features of facility building, equipment, tools, and utensils that make them easy to access, inspect, clean, and maintain. Hygienically designed tools may be made of EU food contact compliant material, have a smooth surface finish, and can be of one-piece construction or are easily dismantled and reassembled after cleaning and disinfection.

Sanitation: Involves establishing, improving, and maintaining a hygienic state of the facility with the aim of minimising contamination incidents. This not only involves cleaning and disinfection of surfaces, but includes programs like preventive maintenance, personnel hygiene, hygienic design, hygienic zoning, and environmental monitoring and control.

Wastes: Non-value-added items or work that the customer does not want to pay for. In the lean enterprise, they are generally of seven types (exemplified in the acronym: TIMWOOD): Transportation, Inventory, Motion, Waiting, Over-production, Over-processing, and Defects.

SELECTED REFERENCES

[5S in the Food Industry - Examples and Tips for Implementation](#)

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