

Choosing hygienically designed cleaning tools

- what are they and why it matters

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WHAT ARE HYGIENICALLY DESIGNED CLEANING TOOLS?

The hygienic design of something is related to how easy it is to clean. It can also relate to the materials it is made of⁽¹⁾.

The principles of hygienic design have been defined⁽²⁾ by the European Hygienic Engineering Design Group (EHEDG, see www.ehedg.org).

Vikan are Company
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These principles state that equipment should be/ have,

- free of crevices and contamination traps e.g. use of smooth joins, absence of small holes, recesses, and sharp internal angles
- a smooth surface finish (R_a less than $0.8\mu\text{m}$)

- easy to clean (and dry) e.g. quick and easy to dismantle/re-assemble, or of one piece construction, or with easy access to all areas for cleaning and disinfection
- made of food safe materials i.e., non-toxic (in compliance with EU food contact material legislation)
- well constructed e.g. durable
- non-absorbent
- appropriately temperature and chemical resistant i.e. to dishwashing and autoclaving, to cleaning and disinfection chemicals.

WHY HYGIENIC DESIGN MATTERS

Thanks to EHEDG, many food manufacturers already appreciate the benefits of using hygienically designed production equipment, i.e. that it is quicker and easier to clean, and minimises the risk of product contamination by microbes, allergens, foreign bodies etc. This in turns maximises food safety and quality, reduces the risk of expensive product rejection or recall, and minimises food waste. However, when it comes to the equipment used to clean the food production environment and production equipment, very few cleaning tools are developed with good hygienic design in mind.

Cleaning equipment has been shown to be a major source of contamination. One study⁽³⁾ showed that 47% of the cleaning equipment investigated was contaminated with a harmful bacterium (*Listeria monocytogenes*). It was not clear whether this was due to poor cleaning of the cleaning equipment or to their poor hygienic design (or both). Another study⁽⁴⁾ found that much of the cleaning equipment currently used in the food industry is difficult to clean, i.e. of poor hygienic design.

The hygienic design of brushware poses a particular challenge. The most commonly used construction method for brushes and brooms currently involves the drilling of holes into a solid plastic block and then stapling tightly packed filaments into the holes. This creates possible dirt traps both within the holes and between the filaments. Other brushware manufacturing techniques do exist, i.e. fused filament and resin set, but all were shown to have hygienic design issues.



Courtesy of CampdenBRI. Channel, potential contamination trap in a resin set food industry

Due to the poor hygienic design of brushware some high-risk dry goods environments, like baby formula manufacture, use brushes once and then throw them away, rather than the risk the possibility of cross-contamination.

Consequently, the ability to clean the cleaning equipment itself is critical to ensuring food safety and quality, and the application of good hygienic design principles makes this possible. This may be the driver behind the new audit requirement in the British Retail Consortium (BRC) Global Standard for Food Safety v7⁽⁵⁾, that 'cleaning equipment shall be: hygienically designed and fit for purpose' (section 4.11.6).

HOW VIKAN CAN HELP

As a long established provider of professional cleaning tools, who work closely with the food industry, Vikan understands the challenges the industry faces, including issues related to the cleanability of cleaning equipment. Vikans Global Hygiene Specialist, Deb Smith, is a Committee member of the UK:IE EHEDG Regional Section and has published articles on the application of hygienic design principles in the EHEDG Yearbook⁽⁶⁾, the Journal of Hygienic Engineering Design⁽⁴⁾, and New Food⁽⁷⁾.

Deb explains, "There are many reasons why the application of hygienic design to cleaning equipment is so important. The ability to quickly and easily decontaminate a cleaning tool not only saves time and effort but also improves food safety, quality and shelf life. By minimising the risk of cross-contamination, the risk of product rejection and, consequently, product waste is reduced. The risk of product recall or prosecution is also reduced, thus protecting/improving company reputation and income. That's why Vikan are passionate about developing cleaning tools for the food industry that are truly hygienically designed."

Vikan are pioneering the development and use of hygienically design cleaning tools through their Ultra Hygiene range. Using the hygienic design principle defined by EHEDG, Vikan have developed the Ultra Hygiene range for use in areas where hygiene is critical for the maintenance of food quality and safety. The range includes Ultra Hygiene handles, Ultra

Hygiene squeegees, and our multi award winning Ultra Hygiene Technology (UST) brushware. All feature a fully moulded construction, minimal presence of crevices and contamination traps, smooth surface finishes, easy access to all areas for cleaning and disinfection, and durable construction. Additionally, all are made of non-absorbent, EU and FDA food safe materials, which are appropriately temperature and chemical resistant.

Vikans Ultra Hygiene handles are easy to clean with a smooth surface finish and a large hanging hole for easy to clean access. They are made entirely from food grade, reinforced and recyclable polypropylene that can withstand industrial cleaning chemicals with no corrosion.



Vikans Ultra Hygiene squeegees, available in both hand held and floor use versions, are ideal for use in areas requiring the highest level of hygiene. They have been hygienically designed with a fully moulded construction and smooth, sloped and rounded surfaces to make them easier to clean. The materials used in the squeegees construction are chemical

and heat resistant. They are also dishwasher and autoclave safe.



Vikans Ultra Safe Technology brushware (UST) have been developed specifically to minimise the risk of contamination from trapped food, microbes, and moisture, and reduce bristle loss. Their fully moulded construction eliminates the need for drilled holes, staples and resin, thus minimising the presence of crevices where contamination can be trapped. Additionally, their unique construction enables every bristle to be individually fixed, so that the loss of one bristle does not affect the security of others in the bundle. This minimises the risk of bristle loss and therefore of foreign body contamination. They also have a unique bristle patterns designed and tested to improve the functionality and cleanability of each brush type. All UST products are made entirely of recyclable materials that are EU and FDA food contact compliant.



Vikan are passionate about improving food safety and quality through the application of hygienic design in their products, The Ultra Hygiene range have been specifically developed with this in mind but all new and improved Vikan products are subject to application of hygienic design principles, as appropriate, at the design phase. For example, our new 20 litre bucket has open, sloped carrying handles that make them easy to clean and drainable. It also has sloped drainage holes in the base, also to allow drainage when stored upside down.



Unfortunately, not all manufacturers of cleaning equipment that is used in the food industry have in-depth knowledge regarding hygienic design. Recently, the term “Ultra Hygienic” has been used in the market place to describe other cleaning equipment that may not conform to EHEDG hygienic design principles. It is therefore essential that, when choosing cleaning equipment for use where hygiene is critical, the equipment be selected with these principles in mind.



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REFERENCES

- ⁽¹⁾ EHEDG Guideline Document No. 32 (2005). *Materials of construction for equipment in contact with food*.
- ⁽²⁾ EHEDG Guideline Document No.8 (2004). *Hygienic Equipment Design Criteria*.
- ⁽³⁾ Holah, J.T. (1999). *Effective microbiological sampling of food processing areas*. Guideline No. 20, Campden & Chorleywood Food Research Association.
- ⁽⁴⁾ Smith, D.L. (2015). *The hygienic design of food industry brushware - the good, the bad and the ugly*. Journal of Hygienic Engineering and Design. Vol. 12, pp. 8-17.
- ⁽⁵⁾ British Retail Consortium (2015). *Global Standard Food Safety*. Issue 7, January 2015.
- ⁽⁶⁾ Fairley, M., Smith, D., and Timmerman, H. (2015). *Hygienic operation of floor drainage*. EHEDG yearbook 20015-16.
- ⁽⁷⁾ Smith, D. L. (2015). *Decontamination of food industry cleaning brushware – A matter of hygienic design*. New Food Magazine – Hygiene supplement. Issue 3, June 2015.