

## Taking Hand Hygiene Further with Gloves

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### Perspective

In the food service and processing industries, the wearing of gloves is more than just protection for the hands—they are also highly effective barriers against the transmission of contaminants and harmful bacteria.

From chefs who don't wash their hands before cooking, to workers that have exposed wounds and cuts, or sneeze and cough when handling and serving food - the food service industry is rife with stomach-churning stories, particularly when it comes to hygiene. In truth, while we often take the cleanliness of the food we eat for granted, the odds are rather high that a worker preparing or handling your food is either sick or hasn't washed their hands after using the restroom.

A recent UK Food Standards Agency survey showed that an alarming one-third of caterers fail to wash hands after using the toilet [1].

But good hygiene extends beyond food service to the vast spectrum of other roles involving food handling and processing; from workers handling fish and seafood at the port, to those selling fresh produce at wet markets, as well as factory workers who prepare the meat before they are packaged and placed on supermarket shelves, and everyone in between.

In addition to personal hygiene, one of the highly recommended practices of good hygiene in the food processing and service industry is the wearing of gloves. It is a widely-accepted fact that gloves can effectively act as a final line of defense against bacteria transfer and hence food contamination.

Viruses like Hepatitis A and the highly contagious Norovirus are responsible for about 50 percent of all outbreaks of food-related illnesses and are transmitted through foods like leafy greens, fresh fruits and shellfish. Other serious food-borne illnesses caused by bacteria like *E. coli*, *Salmonella typhi*, *Shigella* and *Listeria* can also be avoided with appropriate hygiene practices, such as the wearing of the right gloves.

This is the reason why most establishments in the United States involved in large-scale food handling or preparation, such as restaurants, factories, hotels, hospitals, airlines and large-scale caterers, demand that their workers don gloves. In fact, 41 States in the US adopted the "No-Bare-Hands" food safety rule in 2014, requiring food service workers to wear disposable gloves for food preparation, with the aim to reduce the transmission of foodborne illnesses.

In certain types of cuisine, gloves have also become important to avoid the risk of contracting allergies. Sushi chefs, for example, who work with uncooked fish and seafood, tend to find gloves particularly useful especially when they encounter customers with specific allergies.

By using gloves, chefs can help to ensure that none of the food allergens from one dish is transferred to another by accident.

It goes without saying that customers are also more at ease when they see their food being served by staff wearing gloves, as it conveys a higher standard of hygienic practices by the establishment.

However, one of the concerns about gloves, at least among food industry workers who rely on their hands to feel, grip, assess and prepare foods, is that gloves tend to mute the sense of touch and has a perceived reduced dexterity. But with more than 200 varieties of gloves in the market today, it is safe to say that the hand-care industry has moved beyond one-size-fits-all gloves, to customized gloves that are designed specifically to suit different job requirements.

New technology has enabled the production of nitrile gloves that offer consumers a comparable alternative to latex gloves, which are a common cause of skin allergies. At the same time, nitrile is far superior in dexterity, protection and feel compared to the cheaper vinyl or PVC gloves, which does not provide adequate protection against hot or oily food, nor the required dexterity, comfort and movement for the hands.

This is one of the reasons why Malaysian glove manufacturer, Smart Glove Corporation, has channeled tremendous research and development (R&D) dollars into developing an innovative, sustainable yet cost-effective range of nitrile gloves, codenamed the Nitrile S-series Glove, that are custom-made to suit specific job requirements across various industries. The specially designed food-contact Nitrile-2.0 (2 gm/2.2 gm range) glove is one of the main products to have come out from the Nitrile S-series research.

	Smart Glove's Nitrile 2.0 Glove	Standard Nitrile 3.0 mil/3.5 g Glove
<b>Tensile Strength</b>	<b>MPa</b>	<b>MPa</b>
Specification	min 20	min 17
Typical Value	25-35	21-25
<b>Ultimate Elongation</b>	<b>in %</b>	<b>in %</b>
Specification	min 500	Min 400
Typical Value	520-620	500-600
<b>Typical Thickness</b>	<b>Mm</b>	<b>mm</b>
Finger	0.05	min 0.07
Palm	0.04	min 0.06
Cuff	0.03	min 0.05
<b>Typical Weight</b>	<b>Grams</b>	<b>grams</b>

Size M	2.2 ± 0.2	3.5 ± 0.2
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**Table 1:** The 3.0 mil (3.5 g) gloves specification above meets the medical glove standard (US' ASTM).

“We have always endeavored to design gloves that fill current gaps in the market and offer the most competitive solutions for the hand-care industry. Our drive to develop tech-driven and sustainable hand-care solutions has created the Nitrile-2.0 Glove, which is an eco-friendly glove,” said Mr. K.P. Foo, Founder and Executive Chairman of Smart Glove Group.

“In the long run, the Nitrile-2.0 is more durable and cost-effective, and because they are tailored according to the needs of the user, they are also able to provide the best possible dexterity, durability and grip to perform their jobs efficiently. In fact, they are so light and fitting that it will feel like ‘second skin’, and users will barely notice that they are wearing any gloves,” added Mr. Foo.

As the world's lightest Nitrile glove, being extremely thin and light without compromising on its strength and durability, the Nitrile 2.0 is highly suitable for the food service and handling industry.

The table above demonstrates that the newly-formulated Nitrile 2.0, although thinner than the standard 3.0 mil (3.5 gram) glove, has an equal or higher tensile strength (measured in Megapascal or MPa), which is the level of pressure (force) applied to the glove at point of breakage.

At the same time, the Nitrile 2.0 can also be stretched up to 6.2 times its original size (620% elongation), giving it superior fit, softness and dexterity. All this points to the fact that the Nitrile 2.0 can be used for the same purpose and in the same manner as the 3.0 mil/3.5 gm gloves with comparable if not superior protection and durability.

Considered the ‘greenest’ Nitrile in the world, the Nitrile-2.0 Glove consumes about 30% less resources to manufacture than its counterparts. Compared to a standard 3.5 gm glove, the Nitrile 2.0

which weighs about 35% lighter, requires less material and energy to produce; and being thinner and lighter, also less space for storage and transportation. As a result this ‘green’ glove generates less volume of waste upon disposal (Note: nitrile gloves are usually disposed-off by way of landfills or incinerators), leading to lower environmental impact and reduced carbon footprint in the long-run.

Since the launch of Smart Glove's revolutionary Nitrile 2.0 gloves at the end of 2017, the company has sold about 600 million pieces (as of July 2018). These gloves have been sold mainly to the food industry and have seen growing interest in markets like USA, Europe, Japan and Australia where food hygiene practices are strictly regulated. Those in the upstream food processing value chain, such as in meat or poultry processing, can also opt for Smart Glove's design-patented fishscale or diamond textured gloves, which can be of any thickness required, promoting not only hygiene practices but also superior grip for use in tougher, colder or wetter conditions.

To fully reap the benefits of wearing gloves, experts advise adhering to the following practices:

- Wear gloves that are designed for the task
- Always wash, dry and sanitize hands before donning gloves
- Change gloves regularly and ensure that there are no cross-contamination
- Wash your hands after removing gloves or when changing gloves
- Constantly train and reinforce good hand hygiene practices among your restaurant workers and staff

A combination of good personal hygiene, a clean and sanitized workplace as well as wearing the right kind of gloves for the job can go a long way in ensuring that the food service and processing industry upholds the highest standards in good hygiene practices.

## References

1. Michaels B (2004) Understanding the Glove Risk Paradigm: Part I. Food safety.