

CLEAN MACHINES

CABLES AND CONNECTORS FOR FOOD AND BEVERAGE APPLICATIONS

WHITE PAPER

If you work with food and beverage machinery, you know that bacteria can grow in unexpected places. One often-overlooked hiding place for microbes is within the machine's cabling and connectors.

Paying close attention to these areas during washdown can ensure a hygienic environment for food handling and production. Here's a look at some lesser-known aspects of maintaining good cable hygiene.

FOOD AND BEVERAGE HYGIENE PROTECTION

Breaking down machine parts into three zones tells you more about the level of attention they need:

- **Hygienic design zone.** Machine parts that come in contact with food—including stirrers, filling nozzles, blades and cutters.
- **Splash zone.** Areas and machines that come in contact with food through spraying. A risk assessment determines whether the food can return to the hygienic design zone.
- **Non-product zone.** All parts of a factory not in direct contact with food such as packaging machines. These areas are often cleaned together with more sensitive areas, which in turn can result in high chemical and mechanical stresses.

CLEANLINESS IS KEY

Basic washdown techniques alone aren't enough to assure clean equipment for food and beverage. Strong cleaning agents like corrosive acids and alkalis are standard. Workers either wipe the surfaces dry or use a hot steam jet at the end of the cleaning process.



LAPP's SKINTOP INOX® is a compact, corrosion-resistant stainless steel cable gland with smooth surfaces for splash zone use in food and beverage machinery.

There's also an evolving alternative to these aggressive cleaning agents: dry ice. With this method, particles of dry ice—with temperatures as low as -80°C—blast onto soiled surfaces such as tanks, boilers and ovens between 2 and 6 bar.

Both of these methods have some influence in the growth of bacteria and whichever you choose, always make sure the surfaces are completely dry.

The Food Safety Modernization Act (FSMA), which was signed by presidential order in 2011, states that food producers must take all necessary steps to prevent foodborne illnesses and pathogens. In the past, machine operators waited until *E. coli* or other bacteria had already grown before taking any measures—they solved the problems after they occurred, instead of preventing them.

Now, anyone who operates food and beverage machines must have proper documentation showing that the right preventative measures have been put into place. Following these preventative guidelines reduces the chance that residue will build-up on cable glands in the first place. One reliable option that meets all FSMA standards is LAPP's Skintop cable gland, notably the **SKINTOP INOX®** and **SKINTOP® HYGIENIC**. INOX is a compact, corrosion-resistant stainless steel cable gland with special design features that prevent microorganisms and bacteria from sticking to the surface. With its smooth surfaces and unique shape, LAPP's **SKINTOP® HYGIENIC** prevents the accumulation of fluids for the safest cleaning possible (See sidebar).

Some materials, such as stainless steel, can handle harsh cleaning regimens for the long haul. But some plastics cannot. Using plastics or elastomers when they're not suitable for frequent cleaning can make system parts lose their protection rating, and cables can lose their insulation properties.



Specialized cable glands for food and beverage applications such as LAPP's **SKINTOP® HYGIENIC** are designed to satisfy the industry's stringent washdown requirements.

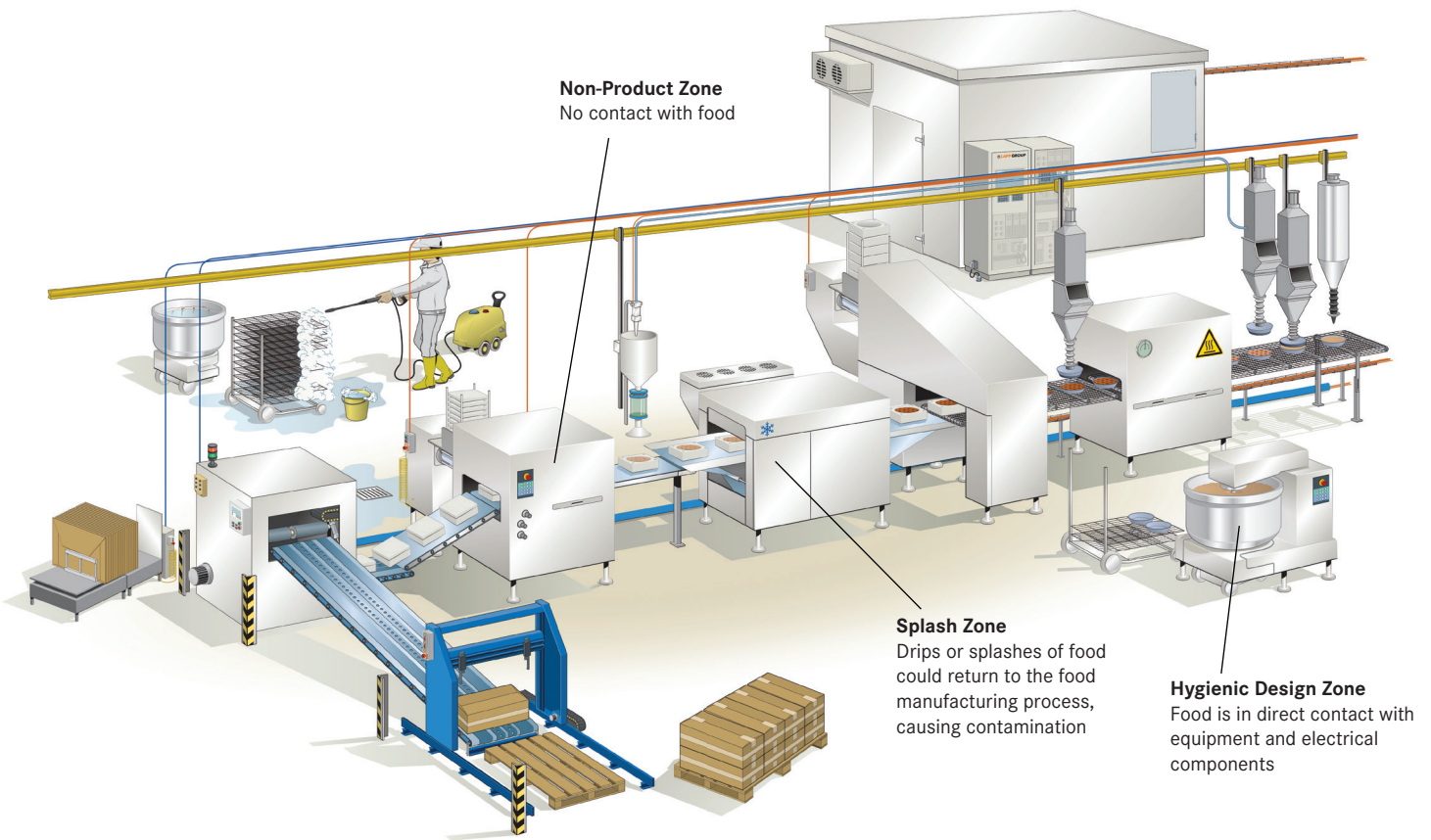
One example involves a bakery, where emission of CO₂ from the dough caused a cable sheath to swell and become brittle. The employees were put in immediate danger because there was a risk of short circuiting and electrical shock. In addition, the quality of the product was also jeopardized since the plastic could have fallen into the dough.

SKINTOP INOX®

- Corrosion and seawater resistant, smooth surfaces with no edges, compact design, wide and variable clamping ranges.
- Available with NPT threads
- Stainless steel version with compact design for use in the splash zone in food production
- Material
 - Body: stainless steel - V4A (1.4404/316L)
 - Insert: polyamide
 - Sealing ring: silicone
 - O-ring: silicone
- Protection rating
 - IP68: 10 bar (M12 - M20)
 - IP68: 5 bar (M25 - M32)
 - IP69 K
 - Temperature range: -40 to 100°C

SKINTOP® HYGIENIC

- For ideal cleaning results
- Smooth surfaces and no edges prevent the accumulation of fluids and formation of microorganisms.
- Material and shape provide an easy and safe cleaning
- Blue coloring of the sealing material clearly distinguishes from food
- Rounded key areas for mounting with standard tools
- Chemical resistance, wide clamping range, mechanical resistance, temperature resistance.
- Classification: ETIM 5.0 Class-ID: EC000441
- Material
 - Body: stainless steel - V4A (1.4404/316L)
 - Insert: polyamide
 - Sealing material: special elastomer
- Protection rating: IP68 - 10 bar, IP68 K
- Temperature range: -20 to 100°C



Segmenting food and beverage machine parts into three zones tells you the level of attention they require.

AVOID LOOSE CABLES

Another big challenge is figuring out which type of cable installation is right for your application. Cables become less accessible when they're bundled together too tightly. Loose cabling with a bit of play would be ideal for easy cleaning. However, technical inspectors normally place great importance on the use of fixed installation—a happy medium must be found.

Overly long cables present a major problem: they're often installed with some excess length so there's a reserve. This approach is both comfortable and problematic in terms of electrical engineering and if multiple cables are combined into one, there's less cable space and intermediate space where impurities can accumulate. These cables should be installed as far away from the intensive cleaning process as possible.

OBSERVE FOOD SAFETY STANDARDS

In the past, food manufacturing companies have faced legal punishment for neglecting food safety standards. When dealing with something that people ingest, taking safety-related shortcuts can lead to serious harm to consumers. So in general, spending a few extra dollars and paying closer attention to these standards eliminates issues for both you and your consumers.