KOLLMORGEN
Because Motion Matters™

SANITARY EQUIPMENT CONSIDERATIONS

The American Meat Institute (AMI) generated a fact sheet related to *Sanitary Equipment Design* with a goal to minimize the spread of listeria in meat processing plants. The United States Department of Agriculture (USDA) Agricultural Marketing Service (AMS) publishes a set of guidelines for sanitary design and fabrication as well. These guidelines help the OEM machine builder to design sanitary solutions for the food and beverage processing and packaging industries.

Kollmorgen looked at the ten sanitary design principles recommended by the AMI Equipment Design Task Force (EDTF) and the USDA guidelines for sanitary design to help determine how automation system design plays an important role in processing and packaging machinery.

1. **Cleanable to a Microbiological Level**: This means you need to be able to really clean and sanitize the machine — all the way to the microbiological level. Keeping the machine as open as possible gets rid of those pesky nooks and crannies where armies of microorganisms like to camp out. If you need to wash down your machine, you need to get to all parts of the machine easily and all places where bacteria can hide must be eliminated. Consider using rounded IP69K rated servomotors to drive the machine mechanisms — this gets rid of protective housings that "close up" the machine making it extremely difficult to attack the invaders. IP69K is an extension of the IP Code identifying enclosures which are dust tight and are able to withstand high-pressure wash-down and steam cleaning. Also consider using NEMA 4X rated enclosures which are watertight and corrosion resistant.

2. **Made of Compatible Materials**: Make certain any materials used throughout the machine won't react with each other in some bazaar way. Stainless steel (304 or 316) is always a great choice as it plays nicely with a lot of other materials, water, and even most chemicals you might use in a wash down environment.

3. **Accessible for Inspection, Maintenance, Cleaning, and Sanitation:** Similar to item 1 above – the more open the machine design can be, the more likely you will be very successful in keeping nasty stuff out. We've seen numerous attempts to use unprotected or semi-protected servo motors on machines that require wash down. So much effort is then put into designing special protective enclosures that start to "close up" the machine, defeating the principle of open, easily accessible design. The use of IP69K servos reduces the cleaning time for end users, enhancing their machine OEE.

4. **No Product or Liquid Collection:** Think round. Surfaces that are rounded will prevent pooling and allow liquids to drain away from the machinery. Everything should have rounded edges and no indentations where liquid can collect.

5. **Hollow Areas Should be Hermetically Sealed:** Eliminate any hollow frames or rollers from the machine if possible. A well protected rounded servomotor design, IP69K sealed and vented properly will keep the machine design simple and free from additional mechanical contraptions that require additional cleaning or could harbor bacteria. Venting is important for sealed hollow elements of your machine, such as motors, that get hot and then cool down. As motors cool, the internal pressure drops, pulling outside atmosphere in. Venting significantly reduces the risk of pulling moisture and contaminants inside the motor helping to maintain the internal pressure close to that of the surrounding environment. A properly vented motor is critical to the long-term reliability in a washdown environment.

6. **No Niches:** What's a niche anyway. Niche derives from a middle-ages French word "nicher meaning nest. Something you really do not want on your meat processing machine – a nest for bacteria to take root and grow. Niches include pits, cracks, corrosion, recesses, open seams, gaps, lap seams, protruding ledges, inside threads, bolt rivets and dead ends. Keep things

round and corrosion free without any sharp corners or nooks and crannies that just might be ideal real estate for some nasty bacteria to set up shop and ruin your brand reputation. Nooks and crannies are great for English muffins but not for the equipment that makes and packages them!

7. **Sanitary Operational Performance:** When the machine is running, it also needs to continue to operate with good hygiene. For the most part, use of certain kinds of materials in seals and bearings will keep you safe on this front. Anything that possibly could contribute to bacterial harborage and growth is a bad idea.

8. **Hygienic Design of Maintenance Enclosures:** Certainly try and eliminate any enclosures you can, keeping the machine open. It is also important to consider your HMI, switches, handles, push buttons, and other interfaces as well. Considering a well-protected IP69K servomotor goes a long way in eliminating extra housings or enclosures. Also look for sealed HMI panels or touchscreens which are mounted on angles to encourage runoff.

9. **Hygienic Compatibility with Other Plant Systems:** Just make sure all systems play together nicely and hygienically – electrical, hydraulic, air, steam and water.

10. **Validated Cleaning and Sanitizing Protocols:** It is always a great idea to document and validate your processes so that they do what you expect them to do. Be certain that chemicals you are using for cleaning and sanitation works well with all your machine surfaces. A proven IP69K servomotor solution utilizing 316 series stainless steel gives you the peace of mind that the motion control part of your sanitary machine is covered.

These guidelines were created with the FDA Current Good Manufacturing Practices (CGMP) and Preventive Controls, such as Hazard Analysis and Critical Control Points (HACCP) and the emerging Food Safety Modernization Act (FSMA) Hazard Analysis and Risk-Based Preventive Controls, as references. Organizations such as 3-A, AMI, and USDA provide white papers and other documents with additional insights from contributing subject matter experts. Much information can be found by exploring each organization's available literature.

References:

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ABOUT KOLLMORGEN

Kollmorgen is a leading provider of motion systems and components for machine builders around the globe, with over 70 years of motion control design and application expertise.

Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

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