



ATP Program for Condensate Control

Monitoring surfaces for the presence of ATP is a universally accepted practice in pre-operational inspection prior to producing food, beverage, cosmetic, personal care or pharmaceutical products. Diagnostic ATP tools, like the Charm novaLUM ATP detection system and PocketSwab swabs, have primarily been used on product contact surfaces. More recently, Charm ATP customers have integrated environmental non-product contact surfaces into their novaLUM system sampling plans, including testing condensate or harborage areas where condensate may occur.

Regulatory FDA^A directives and USDA^B guidelines note condensation is “not allowed to form either in product or non-product areas, where the potential for dripping can occur; causing contamination of product.” A review of recalls and warning letters will often reveal where condensate was observed as playing a causative or potentially causative role in contamination of product. RTE food manufacturers, dry food processing and dry clean operations are taking more aggressive strategies to combat condensate. In response, auditors are increasingly focused on inspecting areas where condensate may form, drip and potentially contaminate product.

Condensation is the change of water from vapor into liquid water, so condensate is not necessarily bioactive at dew point. Measuring ATP in condensate provides a science based approach to detecting biological activity. While its presence of condensate does not indicate a pathogen or spoilage organism is present, the risk of environmental spoilage organisms and/or pathogens in condensate

EXAMPLES OF COLDER SURFACES THAT MAY FORM CONDENSATE

Beams	Frames
Catwalks	Freezers (Spiral-Blast)
Ceilings	Hosing
Chillers/Coolers	Ladder racks
Chutes	Overhead rails and trolleys
Defective drip pan or drain lines from air conditioners and dehumidifiers	Pallets
	Pipes
	Railings
Defective light fixture	Refridgeration condensations units
	Staircases
Defective fans in coolers	Unsealed equipment
	Guards
Exhaust vents	



^APer1 US FDA, 21 CFR 120.6(a)(5)

^BUSDA FSIS, May 2006. Compliance Guidelines to control Listeria monocytogenes in Post-Lethality Exposed RTE Meat and Poultry products, and Sanitation Performance Standards Compliance Guide

must be considered, especially when condensate forms on areas that receive infrequent cleaning. Microorganisms expand their mobility range through foot traffic, cleaning and maintenance tools, moving and rolling equipment, and particulate attachment in bio-aerosols. Research^c demonstrates that *Listeria monocytogenes* can survive on condensate-forming stainless steel in low and high nutrient conditions, with or without the presence of biofilms, and can detach with ease. In addition, when colder surfaces come in contact with rising warm air in a food processing plant, and the condensate is allowed to stagnate or collect in areas where it may stagnate, a primary or secondary vector for microbial adulteration of product may occur.

EXAMPLES OF COLDER SURFACES THAT MAY FORM CONDENSATE:

Many of these surfaces are difficult to access for testing and cleaning but must be considered in a comprehensive sanitation program. To combat condensate, take a tactical team approach to pre-requisite programs that involves personnel from sanitation, QA/QC, HACCP, production, engineering and maintenance. Communication and routine training ensures that all parties are vigilant in taking preventative measures to reducing or eliminating condensate as a source of cross-contamination. Documentation and traceability is assured with the Charm novaLUM, as it can be fully programmed with environmental 'condensate sampling plans' random sampling of ATP swab points, and complete tracking of corrective actions.



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The pre-requisites for a successful AllerGiene program include companies which:

- Manufacture products with and without allergens on shared equipment
- Identify condensate forming areas in SSOPs
- Where possible, install covers and shields
- Use portable digital hygrometers to identify precise dew point areas
- Observe employee and mobile equipment traffic patterns
- Add more frequent cleanings and inspections on problem condensate areas
- Evaluate condensate control systems and where best to install
- Avoid high pressure cleaning especially in condensate sensitive areas
- Manage detergent and sanitizer applications for drip pans, e.g., quaternary ammonia solids
- HEPA filtration system in critical areas
- Run the PocketSwab and novaLUM as a tactical tool and if necessary, the PocketSwab extender.



Condensate control is one of many steps to prevent cross-contamination in pre-requisite programs and SSOPs. Sanitary design, documentation control, effective maintenance programs and overall plant design are also essential to prevent condensate from negatively impacting sanitary conditions. Since water is critical to pathogen growth, every opportunity to clean

and monitor areas where condensate may form is just as important as eliminating or reducing the condensate in the first place. ATP presence in condensate and condensate collection areas is rapid and measurable, and alerts the sanitation crew to take immediate corrective action. Take advantage of services offered by cleaning solution providers, microbiology/ ATP vendors, food safety consultants, and auditors.

^cBehavior of *Listeria monocytogenes* in a *Pseudomonas putida* biofilm on a condensate-forming surface. Hassan AN, Birt DM, Frank JF, Center for Food Safety, UGA, Journal of Food Protection, 2004 Feb;67(2):322-7