Air Quality Testing in Food Facilities (Ambient and Compressed Air)

Air quality monitoring within a food processing facility is a crucial component of maintaining a comprehensive environmental monitoring program. Without proper engineering for directing the flow of air and active monitoring of the air within the processing areas, bioaerosols may become a source of product contamination that compromises the safety and quality of foods produced. As such, commonly adopted food safety and quality management programs (e.g., BRC, SQF) prescribe the need for managing and monitoring the microbiological quality of the air to control the risk of product contamination from bioaerosols. In addition to direct contamination of the product, the bioaerosols may land on processing surfaces or equipment and when the right conditions exist (e.g., moisture, organic matter), the physical surfaces harboring microbial contaminants have the potential to be a vector of cross-contamination. Compressed air can also come in direct contact with food products. For example, it can be utilized for adding air into packages to protect food products such as a bag of chips or for cleaning debris off large surfaces that come in contact with the products. Since compressed air can harbor microorganisms and contribute to the contamination of the finished products, it is important that all types of air systems with potential product safety and spoilage implications are continually monitored.

When testing for the microbiological quality of ambient and compressed air, the methods outlined below are air testing strategies that are commonly used:

- Sedimentation (settling) method for ambient air monitoring
  - Standard agar plates utilized for growth of bacteria and fungi (yeast and mold) are directly exposed to the areas of interest for a user-specified length of time (generally 15 minutes). Airborne particles are deposited onto the surface of agar plates by the force of gravity. The plates are incubated in accordance with the applicable methods and bacterial or fungal colonies counts are obtained. While the sedimentation method offers a relatively simple and inexpensive means to collect ambient air samples, this method of air sampling selects for heavier particles that settle rapidly as the method relies on the gravitational force for sample collection.
  - Supplies and EMSL Test Codes

Test	Test Code	Agar Plate	Agar Plate Product ID
Aerobic Plate Count	F163	Tryptic Soy Agar (TSA)	8714001
Yeast and Mold	F164	Malt Extract Agar (MEA)	8714003

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- Impaction method for ambient air monitoring and compressed air testing
  - The impaction method involves actively drawing a specified volume of air via a mechanical vacuum. Particles suspended in the air are pulled in through a perforated metal plate and impacted onto the surface of agar plates and subsequently incubated to observe bacterial or fungal growth. This method has the advantage of allowing users to standardize the amount of air collected, thus enabling normalization of the data over sampling events. On the other hand, the method requires the rental or purchasing of the equipment as well as careful handling and training to avoid contamination of the apparatus prior to sampling.
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  - Impactor Samplers

Air Testing Type	Sampler Description	Product ID	Rental Pricing (Daily)
Ambient	EMSL VP-400 Impactor Kit SAS Air Sampler	87RD007 87RD021	$50 USD $125 USD
Compressed	SAS Pinocchio Super II Sampler	87R5034	$175 USD

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