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FACT SHEET

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COMPRESSED AIR MONITORING

Compressed air is a tool used for many different applications in the food and beverage manufacturing industry and is often used directly on product or product-contact surfaces. As is the case with most manufacturing inputs, compressed air can be a source of contamination. Compressed air can introduce four types of contaminates:

1. Particles such as metal shavings, rust, plastics, etc.
2. Oil in both the aerosol and vapour form
3. Water
4. Microorganisms

Due to these risks, food safety standards such as the GFSI-benchmarked schemes require manufacturers to ensure that compressed air that comes in direct contact with product or product-contact surfaces does not contribute a risk of contamination to the product.

Compressed air can be contaminated through ambient air in the facility, leaks, compressor lubricants, at the sampling point, or through the air compressor system itself, such as through the distribution piping. There are several measures and manufacturing practices that can control contamination risks in compressed air:

Filtration System

- Some GFSI standards recommend having a 0.01-micron filter with an efficiency of 99.999% in the final stage of filtration for compressed air systems. The filter should be as close as possible to the point of use or where the air contacts the product or product-contact surface to protect the air from water and oil aerosols that may be present throughout the distribution system.

Drying System

- To limit the amount of moisture in the system, air should be dried in the compressed air system as much as possible before distribution throughout the system.

Preventative Maintenance and Good Manufacturing Practices

- The air compressor system and filter must be included in the facility's preventative maintenance program. Filters must be changed or cleaned at an appropriate frequency to ensure they do not become saturated and ineffective.
- Where the compressed air comes in contact with product or product surfaces, lubricants used in the air compressor system must be food-grade and allergen-free.
- Nozzles and air hoses must be in good, clean condition and maintained.
- Hoses and nozzles must be stored off the ground.
- Development and implementation of a compressed air monitoring program.

The development and implementation of a compressed air monitoring program will allow manufacturers to determine

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if the air quality in their facility is a source of contamination. These programs are risk-based and unique to each facility. They must consider factors such as the source of air, the type of system (oil-free, oil-lubricated), the filter and dryer system, the age of the system, the piping distribution material (e.g., stainless steel, copper, black iron, etc.), the product process flow, and CCPs that may control contaminants in the air.

A compressed air monitoring program should include the following elements:

What to Test for

Compressed air can be tested for particles, oil, water and microorganisms. What to test for can be determined based on the risk assessment and factors mentioned above.

What Sampling Method and Standard to Use

ISO 8573 is an international compressed air quality standard that classifies contaminant types and air purity classes ranging from 0 (most pure) to 9 (most contaminated). It is the manufacturer's responsibility to determine, based on the risk assessment, what air purity is required for their process. ISO 8573 also outlines methods for sampling and analyzing contaminants. ISO 8573-7 provides a standardized method for collecting compressed air samples for microbial testing; however, the manufacturer is responsible for determining the acceptable limits. Samples must always be collected aseptically and analyzed by an accredited lab. For more information on this standard, please refer to the references listed below.

Where to Sample

The best place to sample is at the point of use where the compressed air directly contacts the product or product-contact surface. It may also be beneficial to test at the compressor to check the air quality at the start of the system and midway through the line to check the distribution system.

Number of Samples

The number of samples will depend on the number of points of use throughout the facility and the location of samples selected. If sampling points are tested randomly, the manufacturer must ensure each point is tested at the frequency stated in the sampling plan.

Frequency of Sampling

Some GFSI standards require annual testing. However, manufacturers are encouraged to test more frequently to allow trending of the results and determine if certain activities (such as maintenance, construction, etc.) or time of year affect air quality. More frequent testing could help support an investigation if products were found to be contaminated.

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