

It is paramount that the air/gas component and contaminate testing be performed with good field sampling and analytical methodology. This means using generally accepted practices that are relevant to operation and are capable of reproducible results. The International Standards Organization, ISO, has published ISO 8573-1 with nine supplementary parts. This specification was written to be very broad and include compressed air for most all uses.

TRI has developed suggested direct and indirect product contact compressed air/gas guidelines based on practical common system capabilities such as whether the system uses a refrigerated dryer or a desiccant dryer for removing water vapor. These guidelines are currently being used as is or modified slightly for specific end uses by hundreds of food, beverage and pharmaceutical processors. The testing methodology is based on the Compressed Gas Association, CGA G-7.1. Commodity Specification for Air.

Below are some suggestions for Food and Beverage Air Testing

In general there are no "hard and fast" air quality standards except for breathing air requirements. One such requirement is OSHA 1910.134, CGA Grade D + Moisture, for breathing air in the workplace. The air used in manufacturing processes should be evaluated by a competent technical individual to determine the appropriate, current good manufacturing practices, cGMP, to protect the safety of the employees and the integrity of the products. For FDA regulated operations in the United States, HACCP compliance is regulated by [21 CFR](#) part 120 & 123. ***88. TRI Air testing suggests performing a baseline, no specification comparison, testing on new or untested systems to help determine the appropriate specification requirements. (Use TRI test item #BLI for the indirect product contact or BLD for direct product contact air/gas tests.)***



Analyte	Employee <u>Breathing Air</u> <u>CGA Grade D +</u> <u>Moisture (OSHA</u> <u>1910.134)</u>	Indirect <u>Product Contact</u> <u>Compressed Air</u> (Nitrogen or CO ₂ extra cost)	Direct <u>Product Contact</u> <u>Compressed Air</u> (Nitrogen or CO ₂ extra cost)	Non-Contact w/ Product Compressed Air (Nitrogen or CO ₂ extra cost)
Oil Mist & Particulate(matter)	5 mg/m ³ (Oil Mist)	1 mg/m ³	0.1 mg/m ³	5 mg/m ³
Moisture/Dew Point	10°F Lower than ambient temp.	1267ppmv/0°F	See Note 1	1267ppmv/0°F
Gaseous Hydrocarbons (minus methane)	N/A	5ppm	2ppm	25ppm
Halogenated Hydrocarbons	N/A	5ppm	1ppm	N/A
Oxygen %, CO ppm, CO ₂ ppm, NO, NO ₂ , SO ₂ (not typically tested)	O ₂ 19.5-23.5%, CO 10ppm, CO ₂ 1000ppm,	N/A	N/A	CO 10ppm CO ₂ 1000ppm
Order TRI test item #	A3	B1	A82 or C23	C65

Note 1: The user should select an appropriate value typically in the range of 0°F(1267ppmv) to - 50°F (67ppmv) depending on sensitivity of the product to water vapor. A dew point of 0 °F requires a refrigerated drier (Use TRI test item C23). A dew point of -50 °F requires a desiccant drier be installed (Use TRI test item A82) in the compressed air system. Other gases such as nitrogen may have different system requirements.

Microbial testing of air/gas sources is also required per common food and beverage regulatory agencies. Please contact TRI Air Testing, Inc. for further information regarding what needs to be tested and the frequency of testing.

TRI Air Testing, Inc. is an AIHA accredited laboratory since 1980 for ISO/IEC 17025:2005, ISO 9001:2015 compliant and participates in a quarterly compressed air Proficiency Testing Program. These accreditations and proficiencies ensure that our lab consistently meets the highest standards of quality and can deliver reliable laboratory test results. To better meet our customer's expectations, we have expanded our Quality Program to include applicable elements of cGMP associated with 21 CFR Parts 210 and 211.

