

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. Unfortunately, it appears that many of the requirements are being adopted with little regard to the practical needs of the specific end use or for the availability of reliable analytical sampling and testing procedures.

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 a the appropriate specification requirements. (Use TRI test item #BLI for the indirect product contact or BLD for direct product contact air/gas tests.)***



## Practical Compressed Air/Gas Testing

Analyte	Employee <u>Breathing Air</u> <u>CGA Grade D</u> <u>± Moisture</u> <u>(OSHA</u> <u>1910.134)</u>	Indirect <u>Product Contact</u> <u>Compressed Air</u>  (Nitrogen or CO <sub>2</sub> extra cost)	Direct <u>Product Contact</u> <u>Compressed Air</u>  (Nitrogen or CO <sub>2</sub> extra cost)	Non-Contact w/ Product Compressed Air  (Nitrogen or CO <sub>2</sub> extra cost)
Oil Mist & Particulate(matter)	5 mg/m <sup>3</sup> (Oil Mist)	1 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
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 <sub>2</sub> ppm,  NO, NO <sub>2</sub> , SO <sub>2</sub> (not typically tested)	O <sub>2</sub> 19.5- 23.5%,  CO 10ppm,  CO <sub>2</sub> 1000ppm,	N/A	N/A	CO 10 ppm  CO <sub>2</sub> 1000 ppm
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.