

Ensuring air quality in the food and beverage industry



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Compressed air is an essential for food and beverage manufacturers and information abounds about how manufacturers can improve their bottom lines by optimising their compressed air supply. However, efficiency is not enough — manufacturers in the food and beverage industry have to ensure that the air they use will not compromise the safety and flavour of the products they are making. Ensuring air quality meets food production standards is absolutely vital.

Several companies in Australia have adopted the British Compressed Air Society's Food and Beverage Grade Compressed Air, Best Practice Guideline 102, as the basis for their air quality requirements. This document not only recommends the level of air quality but also includes recommendations for installation of equipment and the ongoing regular checks required to ensure the quality is being maintained.

Prepared by the British Compressed Air Society with advice given by the British Retail Consortium Trading, the Best Practice Guideline generally breaks the air purity requirements into two sections:

- Compressed air that comes into direct contact with the food.
- Compressed air that could come into indirect contact with the food.

These two alternatives are specified using the International Standard ISO 8573-1:2010.

For compressed air that comes into direct contact with food, the air purity is specified as ISO 8573-1:2010 (2:2:1). This states the pressure dewpoint should be equal to or less than -40°C and the oil content should be less than 0.01 mg/m^3 .

For compressed air that could come into indirect contact with food, the air purity is specified as ISO 8573-1:2010 (2:4:2). This states the pressure dewpoint should be equal to or less than 3°C and the oil content should be less than 0.1 mg/m^3 .

ISO 8573-1:2010 also specifies the maximum number of particles allowed per cubic metre. This is the same for both the direct contact and indirect contact compressed air.

| Particle size | Maximum number of particles/m ³ |
|-------------------------|--|
| 0.1 - 0.5 μm | < 400000 |
| 0.5 - 1.0 μm | < 6000 |
| 1.0 - 5.0 μm | < 100 |

The Best Practices Guideline does not specify what type of compressor, dryer or filters should be used, it is left to the user to determine what equipment best suits their requirements and situation.





Most leading food manufacturers across the globe are getting more and more stringent about the quality at source of the equipment they purchase, such as air compressors. One measure that indicates quality is the certification level of the equipment manufacturer.

ISO 22000 specifies the requirements for a food safety management system where an organisation in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption.

Atlas Copco is the first compressor manufacturer to receive ISO 22000 certification by Lloyds Register for its production facility in Antwerp, Belgium, which manufactures state-of-the-art, oil-free air compressors, blowers and air treatment products. The same HACCP (Hazard Analysis Critical Control Point) procedures as used in the top-quality food companies have been implemented in the design and production of the company's compressors, blowers and dryers.

Selecting an air compressor

There are two basic options for the user to consider when selecting the air compressor: an oil-free air compressor or a lubricated air compressor with filters.

The oil-free option gives the assurance to the user that they cannot get oil contamination from the air compressor, whereas with the lubricated compressor the user must ensure the filters are regularly serviced.

The oil-free compressor has a lower service/maintenance cost than the lubricated compressor with filters.

With regard to the specified pressure dewpoint, to achieve the required -40°C pressure dewpoint (PDP) for

Installation should not be ignored

As important as selecting the correct equipment is getting the equipment installed correctly. The most important issue is ensuring there is adequate cooling for air-cooled equipment and adequate space around the equipment to meet the ongoing service needs.

It is not uncommon to see air-cooled compressors and dryers installed in a plant room with boilers operating producing an ambient temperature well above the outside ambient temperature. This scenario will result in the compressors having overheating problems. A good supply of cool, clean air will ensure the air compressor and dryer will ensure a long, trouble-free operation.

It should also be noted that high ambient/inlet temperatures to both desiccant and refrigerated air dryers have an impact on the size of the dryer: the cooler the inlet air, the smaller the dryer. Obviously this would reduce the cost of the equipment and ongoing operational costs.

the air that comes into direct contact with the food, the user will require a desiccant dryer. Here, again, there are options, including heated, heatless, heat of compression or heated with zero purge.

For smaller capacity systems the heatless is the most common, but with larger systems the heated dryer with zero purge becomes a viable proposition. On very large systems, heat of compression dryers can be considered. Each selection should be based on capital cost against ongoing running costs.

If we now consider where the air only needs to have a 3°C PDP, compressed air that could come into indirect contact with the food, we can consider the refrigerated air dryers — these can cater for small to very large systems effectively.

Maintenance is also important

While the quality of the compressed air equipment is very important, the service and preventive maintenance

of such equipment is of equal importance. The requirements for class zero or oil-free air are very high with an expectation the pressure dewpoint being below -40°C.

As part of a company's drive to have quality air, an oil-free installation will require them to seriously consider quality service and genuine parts. Without the proper consideration for service and spare parts, the quality of the installation and the quality of the compressed air can easily be compromised.

Any compromise on air quality will also directly impact the quality of the end product.

If the production is within the food and beverage industry, compromised air quality can have a devastating effect on the company's products, profitability and also the brand value. In today's world, a strong brand is one significant, if not the most important, business asset.

Often no expense is spared when installing an oil-free air system in order to get the highest possible air quality. However, paying little or no attention to preventive maintenance or the use of genuine parts can reduce the benefits of a first-class system to nothing.

Using non-genuine parts when servicing your compressed air system will significantly increase your risk of a breakdown. Plant interruptions will affect the business operation, wasting time, adding costs and causing loss of production.

Non-genuine parts are not the only potential cause of production problems — using non-qualified technicians

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can also cause concerns by increasing the risk of breakdowns and, more importantly, negatively affecting the quality of the compressed air produced.

Having well planned and managed preventive service agreements performed by qualified service personnel ensures your compressed air equipment is running at optimum performance at all times. However, not only is it running at optimum performance, it is also ensuring your compliance with end-customer requirements and industry standards.

If an oil-free or certified class zero compressed air installation has been specified by your client, it is essential that qualified and certified service together with genuine spare parts are integrated into your operations.

All too often, short-sighted decisions focused around short-term savings when it comes to service of compressed air system can end up costing more than the saving they generated in the first place. More importantly, when the quality of the air is a key consideration, such as in oil-free air installations, this becomes even more critical. To truly ensure the quality of the air in your compressed air installation, genuine parts play a key part, as does planned preventative maintenance and quality service performed by qualified service personnel. In order to ensure air quality in your operations, maintenance plays a key part in the total life cycle of the equipment. Compromising on the service quality and frequency of service is, in essence, compromising on your air quality.



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