



Integrating ISO 8573.1 Compressed Air Quality Classes into SQF Food Safety Certification

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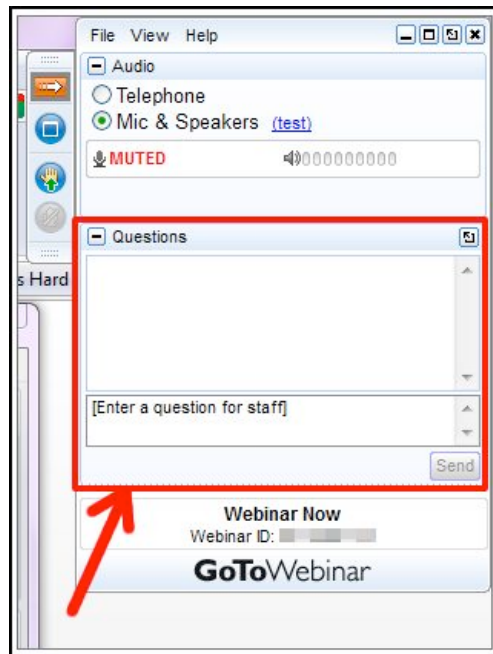
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Q&A Format



- Panelists will answer your questions during the Q&A session at the end of the Webinar.
- Please post your questions in the Questions Window in your GoToWebinar interface.
- Direct all questions to Clinton Shaffer, Associate Editor, Compressed Air Best Practices® Magazine.
- Any questions that go unanswered will be addressed personally with an email after the session.

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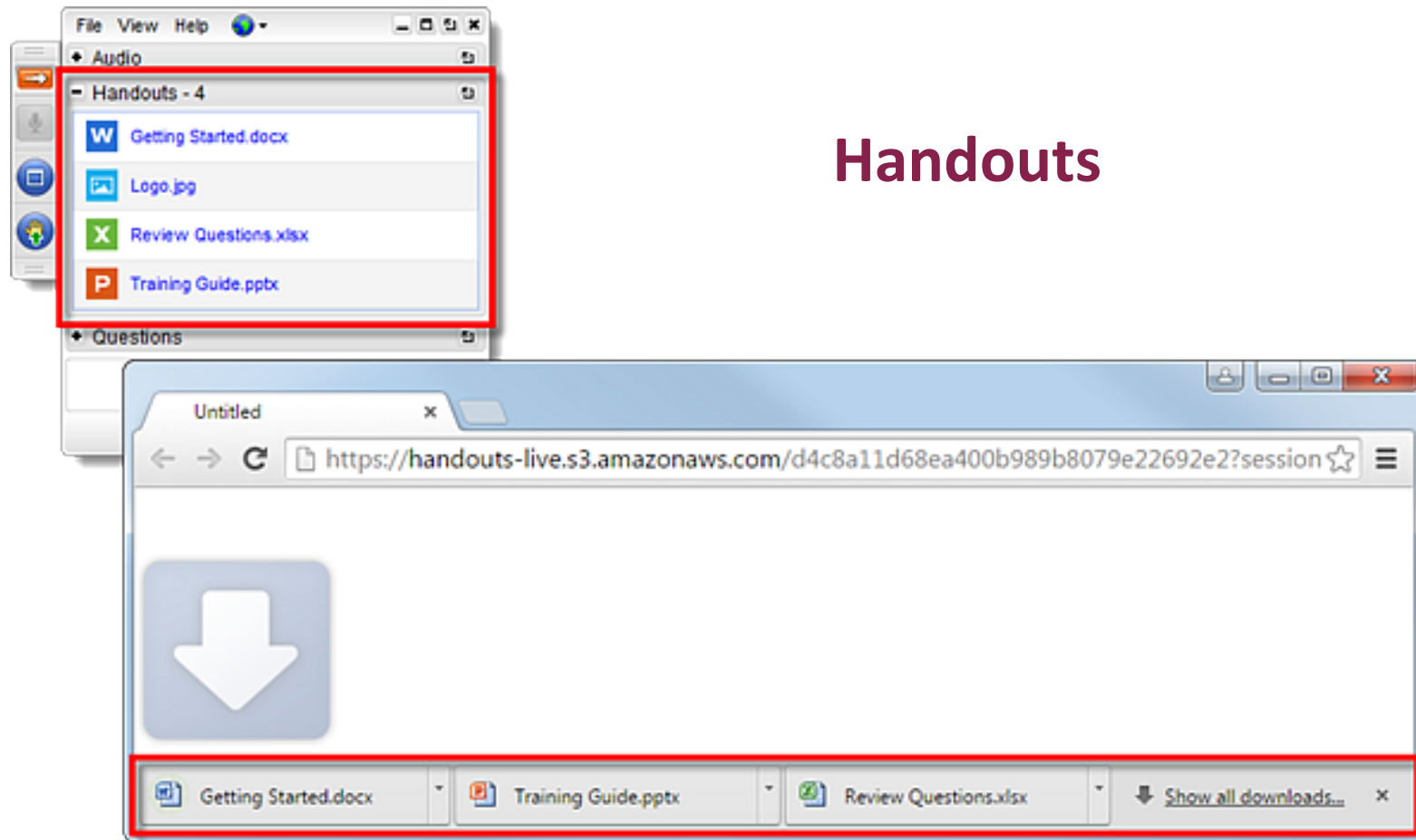
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Handouts





Integrating ISO 8573.1 Compressed Air Quality Classes into SQF Food Safety Certification

Introduction by Rod Smith, Publisher,
Compressed Air Best Practices® Magazine

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About the Speaker



Phillip Kruger,
General Manager, Harris Equipment

- Served as Combat Search and Rescue Medic, completing two tours of duty overseas
- Earned a B.S. in Industrial Engineering from I.S.U.
- Worked at distribution level, designing pneumatic conveying and compressed air systems
- Served as Regional Distribution Manager for a Rotary Screw Air Compressor Manufacturer
- Currently serves as General Manager for Harris Equipment, based in Chicago, Illinois

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Compressed Air Quality

Phil Kruger

Harris Equipment



Compressed Air Quality

Purpose of Meeting:

How to identify and establish a level of air quality suitable for the food processing and food packaging industry using SQF Directives and ISO Classifications.

Directives: SQF 11.5.7 Edition 7.1 - May 2013

ISO 8573.1-2010

BCAS Code 6



General Guidance for Developing, Documenting, Implementing, Maintaining, and Auditing an SQF System

Module 11: Good Manufacturing Practices for Processing of Food Products

SQF Code, Edition 7.1

MAY 2013

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SQF Institute is a division of the Food Marketing Institute (FMI).



Compressed Air Quality

What Does SQF Say About Compressed Air?

11.5.7 Air Quality

11.5.7.1 Compressed air used in the manufacturing process shall be clean and present no risk to food safety.

11.5.7.2 Compressed air used in the manufacturing process shall be regularly monitored for purity.

1. “...clean and present no risk”
2. “...regularly monitored for purity”



Compressed Air Quality

What Does SQF Say About Compressed Air?

“...clean and present no risk”

“...regularly monitored for purity”



SQF Code Module 11 Guidance Document offers more information than previously given, regarding filtration and air testing and states simply that...

“The recommended final stage of filtration in these food contact areas should have a rating of 0.01 micron with an efficiency of 99.999%...”

“...testing must be conducted at a minimum of once a year.”

This is a good start, but this is just that...a good start.



Compressed Air Quality

What Does SQF Say About Compressed Air?

SQF doesn't offer any quantifiable standards that you can set your standard to. The level of quality is vague and leaves a lot of room for interpretation.

But,

ISO has established a quantifiable standard that allows you to measure your system and give it a value. Let's look at it...



Compressed Air Quality

ISO 8573.1:2010

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particles per m³			Mass Concentration mg/m³	Vapor Pressure Dewpoint	Liquid g/m³	Total Oil (aerosol liquid and vapor)
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron				mg/m³
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -100°F (-70°C)	-	0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40°F (-40°C)	-	0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -4°F (-20°C)	-	1
4	-	-	≤ 10,000	-	≤ +37.4°F (+3°C)	-	5
5	-	-	≤ 100,000	-	≤ +44.6°F (+7°C)	-	-
6	-	-	-	≤ 5	≤ +50°F (+10°C)	-	-
7	-	-	-	5 - 10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10



Compressed Air Quality

Where to start?

Identify and Inventory :

Compressed Air Equipment

Compressed Air Treatment (Dryers and Filtration)

Compressed Air Sampling and Testing

Compressed Air Maintenance Program

Documentation



Compressed Air Quality

Where to start?

Once you have preliminarily profiled your compressed air system, it's time to establish what is an adequate and suitable level of quality for your process and application.

Let's take a look at an example...



Compressed Air Quality

For example, if company (A) had the following:

Oil Flooded Rotary Screw(s)
(Food Grade Lubrication)

Particulate Inline Filter rated at 1- 5 Micron with $\leq 10 \mu\text{m}$

37°F PDP Standard Refrigerated Air Dryer (if performing as published)

0.01 mg/m³ Inline Coalescing Filter

Its quality class would be ISO 8573.1 Class 1.4.1

(This is merely a profile based on equipment identification and inventory)

Is this good enough?



Compressed Air Quality

What Now?

The answer to that question is up to you. You have to determine what your level of air quality will look like.

Although SQF and FDA do not give an actual standard, some guidelines that exist in the industry come to us from the BCAS (British Compressed Air Society) and are as follows:



For **direct contact** applications, section 6 of The Code recommends a class rating of 1.2.1.

(1 – 5 micron ≤ 10 per m^3 / $\geq -40^\circ F$ / Less than 0.01 mg/m^3)

For **indirect contact** applications, a class rating of 1.4.1 is recommended:

(1 – 5 micron ≥ 10 per m^3 / $\geq 37.4^\circ F$ / ≥ 0.01 mg/m^3)



Compressed Air Quality

What Now?

Based on your current inventory and preliminary profile, it's time to establish your desired air quality standard and create a **action / compliance** plan to take the necessary steps to achieve and maintain your company's standard.

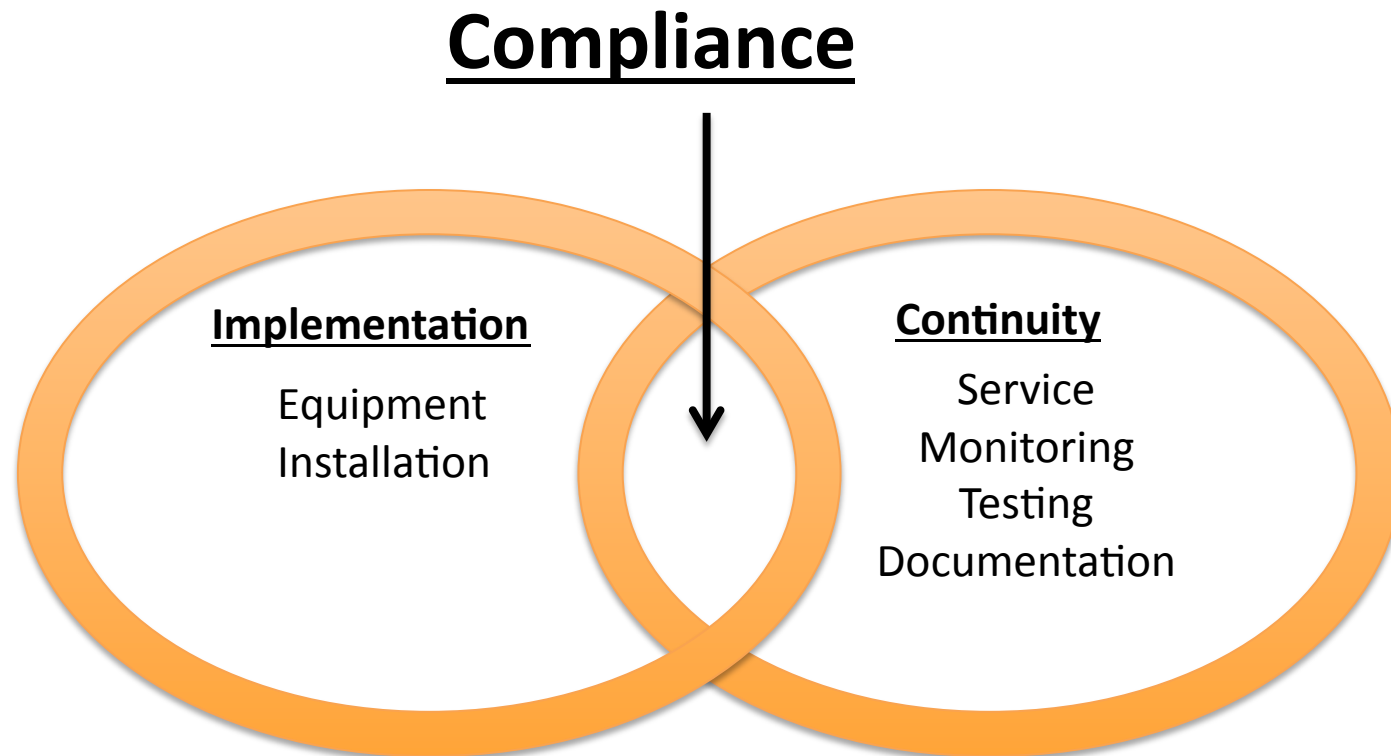
This can be achieved in two measures:

- I. Implementation
- II. Continuity



Compressed Air Quality

What Does a Compliance Plan Look Like?





Compressed Air Quality

Proposed Compliance Plan

Implementation

I. Equipment:

- Compressor(s)
- Filtration
- Dryers
- Drains
- Dew Point Meters
- Hydrocarbon Meters

II. Installation: Correct and strategic installation of equipment



Compressed Air Quality

Proposed Compliance Plan

Continuity

I. Service:

- Predictive Maintenance
- Preventative Maintenance
- Scheduled Maintenance
- Emergency Maintenance
- Emergency Contingencies

II. **Monitoring:** Continuous, scheduled and **documented** monitoring of above services and steps taken to provide quality air

III. **Testing:** Standardized, continuous and documented 3rd party testing of air



Compressed Air Quality

Proposed Compliance Plan

Continuity (cont'd)

Last but NOT least

IV.Documentation:

- Reports
- Results
- Repairs

If it's not documented, it did not happen.



Compressed Air Quality

Questions?

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About the Speaker



Deepak Vetal,
Product Marketing Manager,
Atlas Copco

- Has more than 15 years of experience in the compressor industry
- Worked at different levels in sales and marketing, including: Sales and Service Engineer, Key Account Manager, and Marketing Manager at the national level
- Currently serves as the Product Marketing Manager of Oil Free Compressors at Atlas Copco

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Food Safety & Compressed Air: Why ISO 22000 Certification



Deepak Vetal, 6th Oct. 2015

COMMITTED TO SUSTAINABLE PRODUCTIVITY

We stand by our responsibilities towards our customers,
towards the environment and the people around us.

We make performance stand a test of time. This is what we
call – Sustainable Productivity.

Agenda

- Understanding Food and Beverage industry
- Compressed air usage in Food and Beverage industry
- Objective of ISO 22000
- Scope of ISO 22000
- Types of food safety hazards
- Why is ISO 22000 compliance of compressor manufacturers key for customers?



Food & Beverage Industry

- “The processing industry in which a set of methods and techniques is used to transform raw ingredients into food”

Or,

- “To transform food into other forms for consumption by humans or animals”
- Food processing typically uses clean, harvested crops or slaughtered and butchered animal products to produce attractive, marketable and often long-life food products.



Compressed Air Usage in Food & Beverage

- Compressed air is a safe and reliable power source
- Widely used throughout the food & beverage industry
- Known as the 4th utility (next to electricity, water & gas)
- + 90% of all processing companies use compressed air
 - Low pressure
 - Medium pressure
 - High pressure



>90% of all processing companies use compressed air

Typical Compressed Air Usage in Food & Beverage

Mainly used for:

- Instruments
- Actuators
- Pressurizing
- Aeration of tanks (fermentation)
- Transport of (spent) brewers grain
- Sorting



Compressed Air Usage

Compressed air usage is often split into: “contact” and “indirect contact”

Contact

- Air that **comes** into direct contact with food
- The process where compressed air is used as a part of the production and processing activities, including packaging and transportation



Indirect Contact

- Air that could come into contact with the food
- The process where compressed air is exhausted into the local atmosphere during food preparation, production, processing, packaging or storage



Objective of ISO 22000

- **Ensure “Food safety” by adequate control throughout supply chain**
 - Quality assurance system for Food & Beverage
 - Certification scheme specifying safety management system
 - Derived and based on ISO 9000
 - Requirements for *any* organization in the food chain
- ISO 22000 is auditing and certifying :
 - “**Quality Management System**” and procedures
- ISO 22000 is not defining an air quality as such

ISO 22000 and Food Safety

- Food safety is related to the presence of food-borne hazards
 - in food at the point of consumption
- Introduction of food safety hazards can occur at any stage of the food chain
 - adequate control throughout the food chain is essential
- Food safety is ensured through combined efforts
 - all parties participating in the food chain

Food chain ranges from

- feed producers and primary producers
- food manufacturers, transport and storage operators
- retail and food service outlets
- inter-related organizations such as:
 - Producers of equipment
 - Packaging material, cleaning agents, additives and ingredients
 - Service providers



Scope of ISO 22000

- International Standard and specifies the requirements for:
 - **Food Safety Management System**
 - Combines key elements ensuring food safety
 - Along the food chain till final consumption
- Based on:
 - Interactive communication
 - System management
 - Prerequisite programs
 - HACCP principles (Hazard Analysis & Critical Control Point)



Food Safety Management System

Requirements for any organization in the food chain

- Plan, implement, operate, maintain & update a food safety management system
- System ensuring that products, according to their intended use, are safe for the consumer
- Evaluate customer requirements with those, mutually agreed, relate to food safety ...

- Definition

- **3.1 Food safety**

- Food will not cause harm the consumer when it is prepared and/or eaten according to its intended use.

- **3.2 Food chain**

- Stages and operations in production, processing, distribution, storage and handling of a food and its ingredients, from primary production to consumption
 - 1. Includes production of feed for food-producing animals & for animals intended for food production.
 - 2. Includes **production of materials intended to come into contact** with food or raw materials

- **3.3 Food safety hazard**

- Biological, Chemical or Physical agent in food, or condition of food, with the potential to cause an adverse health effect

Types of Food Safety Hazards

- Purposes of HACCP (**H**azard **A**nalysis **C**ritical **C**ontrol **P**oint) :
 - Identify hazards or conditions of food that can cause:
 - Illness
 - Injury
 - Death of a person
- Hazards fall into three categories:
 - 1) Biological
 - 2) Chemical
 - 3) Physical



1) Biological Hazards (B)

- Biological hazards are those caused by micro-organisms.
 - *bacteria, virus, parasites and mold*
 - *Often associated with the failure of a process step*
 - *(e.g., Pathogen survival due to improper time/temperature applications during pasteurization)*



Application to compressors and related quality air equipment:

- When used as intended, and mentioned in the instruction manuals, the oil free compressors will not generate biological hazards.
- Misuse, such as improper maintenance and clogged drains, might create an environment where pathogenic organisms could develop.

2) Chemical Hazards (C)



- Caused by substances or molecules that can be:
 - *naturally derived from plants or animals*
 - or,
 - *intentionally added to the food during growth or during food processing.*
-
- These substances are considered safe at established levels
 - Can be dangerous above these levels (*e.g., sodium nitrite, pesticides*)
 - Contaminate the food accidentally (*e.g., cleaning chemicals*)
 - Cause some individuals to experience an immune system response

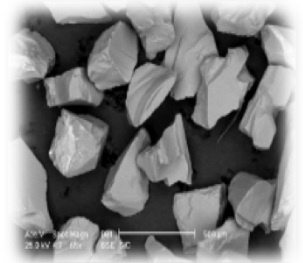
2) Chemical Hazards (C)

Application to compressors and quality air products :



- During the production phase:
 - Components might have some chemical substances on the 'air exposed' parts (*pipings, elements, valves, coolers, ...*)
 - Measures ensure that these substances are eliminated in the production process (*e.g. thoroughly cleaning during assembly & final testing*)
- During the installation:
 - When used as intended, the oil free air compressor will not generate chemical hazards
 - Not covered in "Food Safety Management System"
 - Special attention to the environmental conditions at the air inlet

3) Physical Hazards (P)



- Physical hazards include substances not normally found in food
 - can cause physical injury to the person consuming the food
 - (e.g., *wood slivers, glass fragments, metal shavings, bone pieces*)

Application to oil free compressors and related dryers and filters:

- When used as intended, the compressor might release some particulates from inner parts of components
- In most cases this release is inert.
- Unless otherwise specified in the requirement, no special attention is necessary.
- Filtration to safeguard the relevant ISO 8573 class is advised.

Why is ISO 22000 compliance of compressor manufacturers key for customers?

- We believe that since ISO 22000 certification is key for customers, it should be key for compressor manufacturers, as compressed air plays an important role in the food manufacturing process.
- Working with certified suppliers gives customers peace of mind that the key piece of manufacturing equipment was made in a clean, safe environment.
- Contribution to customers' ISO 22000 certification process
- Being ISO 22000 certified means that a company has a Food Safety Management System (FSMS) in place.
 - This standard demonstrates an organization's ability to control food safety hazards.

The Certificate



Lloyd's Register
LRQA



CERTIFICATE

This is to certify that the Food Safety Management System of:

Atlas Copco Airpower NV
Oil-free Air Division
Boomsesteenweg 957
2610 Wilrijk
Belgium

has been assessed by Lloyd's Register Quality Assurance
and found to conform with the requirements of the following
Food Safety Management System Standard:

ISO 22000 : 2005

The Food Safety Management System is applicable to:

**Engineering and production of Z type class zero oil-free air
compressors (types ZR, ZT, ZE, ZA, ZS, ZH, ZB) and related
dryers and filters for food and beverage industry.**

Approval Certificate No:	Original Approval	:	22 May 2015
ANT000001	Current Certificate	:	22 May 2015
	Certificate Expiry	:	21 May 2018



Issued by: Lloyd's Register EMEA, Antwerp Office for and on behalf of
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**Atlas Copco is the first compressor
equipment manufacturer who's
awarded
ISO 22000**

**Committed to
sustainable productivity.**



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Q&A

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