



Compressed Air Quality Testing

Is your compressed air within specification?

Validation or Indicative Testing?

ISO8573-1 is the international standard for compressed air purity (quality). Introduced in 1991 and now in its third edition, the standard is used extensively to define the quality of compressed air used for a variety of applications in all manner of manufacturing industries.

The standard allows users to select a 'classification' for particulate, water, and oil, with each classification having defined limits of contamination (except for class 0 which is user or equipment supplier definable).

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

Once a facility selects ISO8573-1 air purity classifications for its applications, it is not uncommon for users to want to check the compressed air purity to ensure it is 'within specification'.

There are many pieces of test equipment available which are aimed at compressed air purity testing; however, care needs to be taken when selecting equipment as the test equipment and test method used can seriously impact the reliability of the test results.

Validation of Compressed Air Purity Classes to ISO8573-1

ISO8573 is a series of standards, with Part 1, the most commonly used as it contains the purity classifications (see above). ISO8573 Parts 2 to 9 show the test equipment and test methodology that should be used for the accurate measurement of the different contaminants and confirmation of air purity to ISO8573-1.

If a user wants to validate their compressed air purity to ISO8573-1 classifications, then the standard states that he/she must also test the system in accordance with ISO8573 Parts 2 to 9. These additional parts of the standard give specific requirements for test methodology and test equipment to validate air purity classifications shown in ISO8573 part 1.

If the test equipment intended for use is not listed in ISO8573 Pts 2 to 9, it is not deemed accurate enough for validation purposes. If the test methodologies shown in ISO8573 Pts 2 to 9 are not followed, inconsistent samples may be taken, resulting in concentrated contamination and false readings.

The cost and complexity associated with the specialist test equipment and piping modifications required for validation is high.



Indicative Testing of Compressed Air Purity

If the user wants to test his/her compressed air but not go to the expense of full validation, there is test equipment available that can be used to provide 'indicative testing'. This type of test equipment is typically not able to measure down to the low levels shown in ISO8573-1 or may not provide the level of accuracy required (due to the equipment and / or the sampling methodology).

Using test equipment not recommended in ISO8573 parts 2 to 9 will, however, allow a user to look for major changes to measurement trends which can be indicative of air purity problems (hence the name, indicative testing). It should be noted that when testing with this type of equipment, the results cannot be used to state an ISO8573-1 purity classification, nor can they be used to validate air purity or purification equipment performance.

When employing a third party to provide compressed air purity testing, especially in critical industries where test results may be reviewed by an external auditor, it is recommended that the user confirms if testing is fully in accordance with the specific parts of ISO8573.

For Reference

- Testing Particulate Count – ISO8573-4 (plus ISO8573-7 for microbiological content if required)
- Testing Water Vapour Content (Dewpoint) – ISO8573-3
- Testing Total Oil Content – ISO8573-2 for oil aerosol & ISO8573-5 for oil vapour (results are added together for total oil)

Performance Certification of Purification Equipment

If the cost and complexity of testing and validating compressed air purity fully in accordance with the ISO8573 standards is prohibitive, additional verification may be sought from air treatment equipment suppliers in the form of third party validation for filters and dryers.