

White Paper

Introduction to ISO Compressed Air Quality Standards
By Mark White - Compressed Air Treatment Applications Manager



ENGINEERING YOUR SUCCESS.

ISO

ISO (International Standards Organisation) is the world's largest developer and publisher of international standards.

ISO is a network of the national standards institutes of 159 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that co-ordinates the system. ISO is a non-governmental organisation that forms a bridge between the public and private sectors.

On one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations.

Parker is a member of governing bodies such as BCAS (UK), CAGI (USA) and VDMA (Germany), which directly contribute to the development of international standards for compressed air quality and testing.

There are three standards currently in use which directly relate to compressed air quality (purity) and testing. These are:

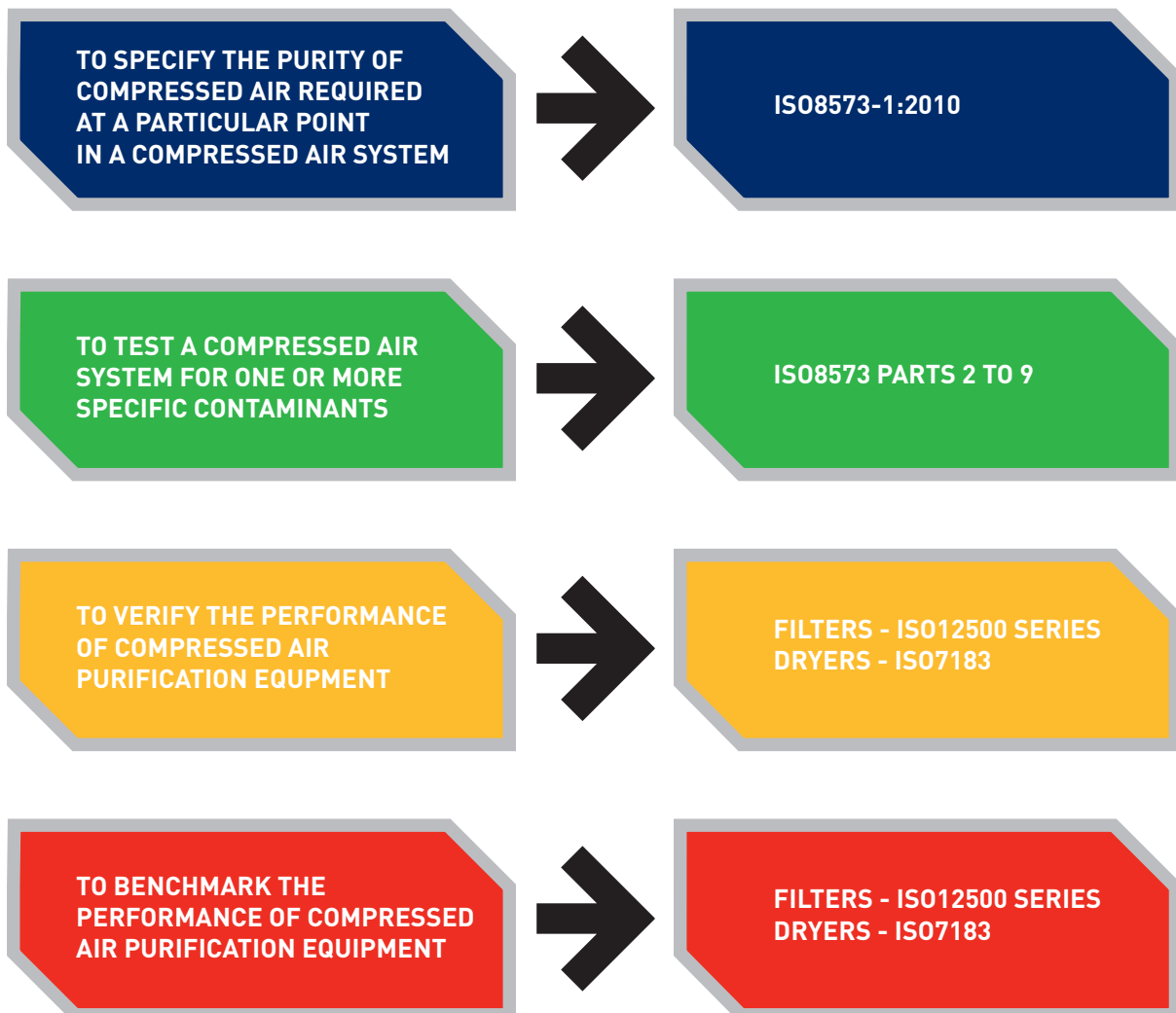
ISO8573 Series / ISO12500 Series / ISO7183

The most commonly used standard is the ISO8573 Series and in particular ISO8573-1:2010.

Which of the three standards should I use?

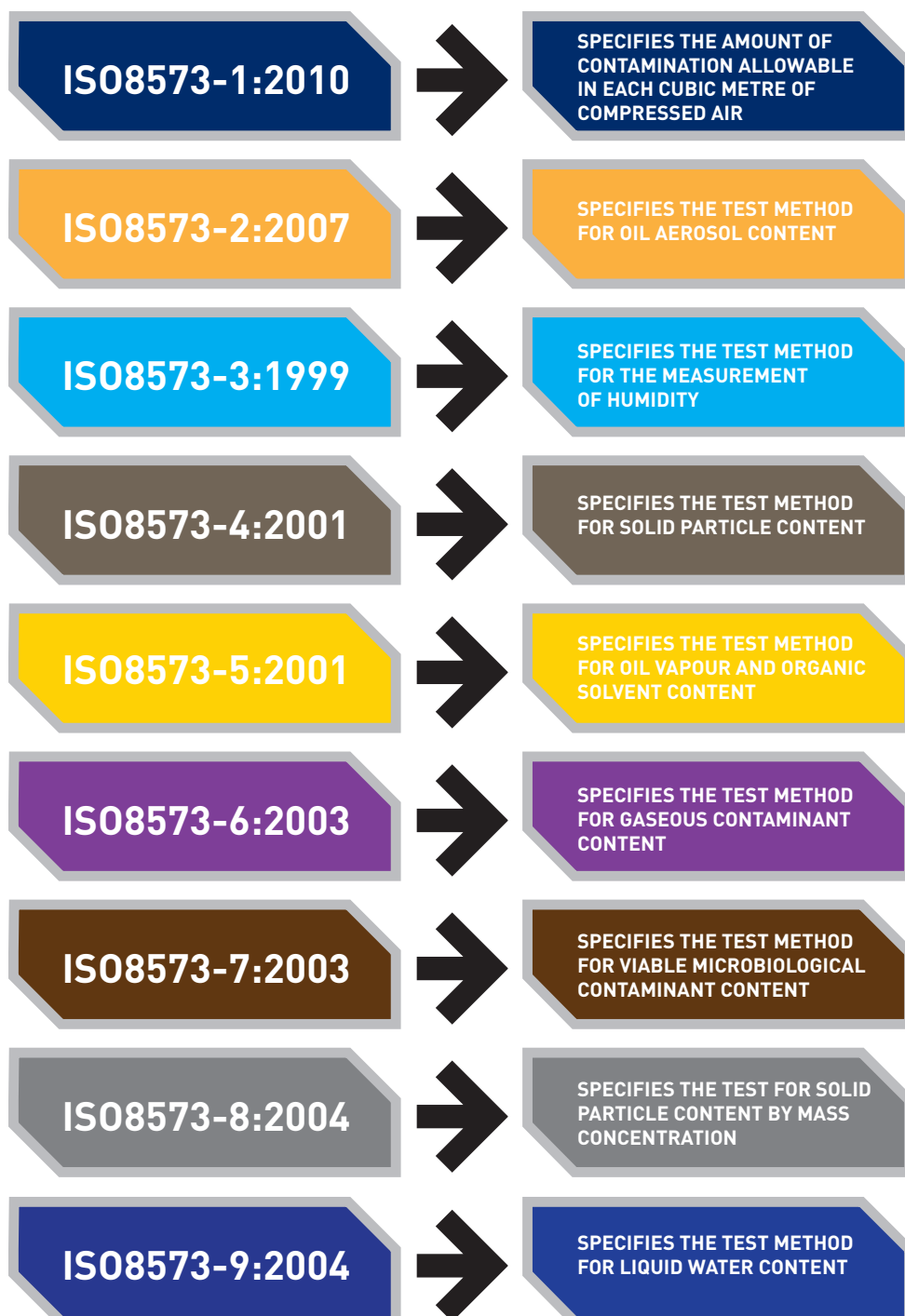
OBJECTIVE

STANDARD TO USE



ISO8573 - the compressed air quality standard

ISO8573 is the group of international standards relating to the quality (or purity) of compressed air. The standard consists of nine separate parts, with part 1 specifying the quality requirements of the compressed air and parts 2 – 9 specifying the methods of testing for a range of contaminants.



Specifying air quality (purity) in accordance with ISO8573-1:2010, the international standard for compressed air quality

ISO8573-1 is the primary document used from the ISO8573 series as it is this document which specifies the amount of contamination allowed in each cubic metre of compressed air.

ISO8573-1 lists the main contaminants as solid particulate, water and oil. The purity levels for each contaminant are shown separately in tabular form, however for ease of use, this document combines all three contaminants into one table.

ISO8573-1:2010 CLASS	Solid Particulate				Vapour Pressure Dewpoint	Water		Oil Total Oil (aerosol liquid and vapour) mg/m ³
	Maximum number of particulates per m ³			Mass Concentration mg/m ³		Liquid g/m ³		
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron					
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	

Specifying air purity in accordance with ISO8573-1:2010

When specifying the purity of air required, the standard must always be referenced, followed by the purity class selected for each contaminant (a different purity class can be selected for each contaminant if required).

An example of how to write an air quality specification is shown below :

ISO8573-1:2010 Class 1.2.1

ISO8573-1:2010 refers to the standard document and its revision, the three digits refer to the purity classifications selected for solid particulate, water and total oil. Selecting a air purity class of 1.2.1 would specify the following air quality when operating at the standard's reference conditions:

Class 1 Particulate

In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 - 0.5 micron size range, 400 particles in the 0.5 - 1 micron size range and 10 particles in the 1 - 5 micron size range.

Class 2 Water

A pressure dewpoint (PDP) of -40°C or better is required and no liquid water is allowed.

Class 1 Oil

In each cubic metre of compressed air, not more than 0.01mg of oil is allowed. This is a total level for liquid oil, oil aerosol and oil vapour.

ISO8573-1:2010 Class 0

The ISO8573-1 Class 0 classification is often misunderstood or applied incorrectly to air compressors or treatment products.

- **Class 0 does not mean zero contamination**
- **Class 0 requires the user or the equipment supplier to show a contamination level as part of a written specification**
- **A Class 0 specification must be 'cleaner' than the Class 1 specification for the contaminant chosen**
- **The Class 0 specification must clearly state which contaminant the it refers to i.e. "Solid Particulate", "Water" or "Total Oil (aerosol, liquid & vapour)"**
- **The contamination levels stated for a Class 0 specification must be within the measurement capabilities of the test equipment and test methods shown in ISO8573 Pt 2 to Pt 9**
- **The agreed Class 0 specification must be written on all documentation to be in accordance with the standard**

Example of a correctly written Class 0 specification

"When preceded by OIL-X Grade AO General Purpose & Grade AA High Efficiency Coalescing Filters, OIL-X OVR Grade Adsorption Filters provide a delivered air quality in accordance with ISO8573-1:2010 Class 0 (≤0.003 mg/m³) for total oil (oil aerosol & oil vapour)"

- **Stating Class 0 without an accompanying contaminant specification is meaningless and not in accordance with the standard**

For further information regarding oil free air and Class 0 for oil, refer to Parker document "White Paper - Myths Surrounding Oil Free Compressed Air"

Selecting Parker purification equipment to comply with ISO8573-1:2010 air quality standard

Simple guidelines for the selection of purification equipment

1. Purification equipment is installed to provide air quality and you must first of all identify the quality of compressed air required for your system. Each usage point in the system may require a different quality of compressed air dependent upon the application. Using the quality classification's shown in ISO8573-1 will assist your equipment supplier to quickly and easily select the correct purification equipment necessary for each part of the system.
2. ISO8573-1:2010 is the latest edition of the standard. Ensure it is written in full when contacting suppliers. Specifying air quality as ISO8573-1, ISO8573-1:1991 or ISO8573-1:2001 refers to the previous editions of the standard and may result in a different quality of delivered compressed air.
3. Ensure that the equipment under consideration will actually provide delivered air quality in accordance with the quality classifications you have selected from ISO8573-1:2010.
4. When comparing coalescing filters, ensure that they have been tested in accordance with both the ISO12500-1 and ISO8573-4 standards.
5. Ask for independent validation of product performance by a third party.
6. For peace of mind, ensure the manufacturer provides a written guarantee of delivered air quality.
7. Oil-free compressor installations require the same filtration considerations as oil lubricated compressor installations.
8. ISO12500-1 requires pressure losses for coalescing filters to be recorded when the element is saturated. When considering the operational costs of coalescing filters, ensure the pressure loss stated in literature is the saturated pressure loss as initial or dry pressure loss is not representative of actual performance in a normally wet compressed air system.
9. Look at the blockage characteristics of the filter. Just because it has a low starting dp, doesn't mean it will remain low throughout the filter element's lifetime. Energy costs should always be calculated based upon the blockage characteristics of the filter, not just initial saturated dp. Ask supplier for verification of blockage characteristics.
10. Look at the total cost of ownership for purification equipment (purchase cost, operational costs and maintenance costs), a low initial purchase price, may look inviting, but may end up costing significantly more in terms of poor air quality and high operational costs.

ISO8573-1:2010 CLASS	Solid Particulate		Water	Oil
	Wet Particulate	Dry Particulate	Vapour	Total Oil (aerosol liquid and vapour)
0	—	—	—	OIL-X Grades A0 (F) + AA (F) + OVR
1	OIL-X Grades A0 (F) + AA (F)	OIL-X Grades A0 (M) + AA (M)	Dryer sized for -70°C PDP	OIL-X Grades A0 (F) + AA (F) + OVR OIL-X Grades A0 (F) + AA (F) + ACS
2	OIL-X Grade A0 (F)	OIL-X Grade A0 (M)	Dryer sized for -40°C PDP	OIL-X Grade A0 (F) + AA (F)
3	OIL-X Grade A0 (F)	OIL-X Grade A0 (M)	Dryer sized for -20°C PDP	OIL-X Grade A0 (F)
4	OIL-X Grade A0 (F)	OIL-X Grade A0 (M)	Dryer sized for +3°C PDP	OIL-X Grade A0 (F)
5	OIL-X Grade A0 (F)	OIL-X Grade A0 (M)	Dryer sized for +7°C PDP	—
6	—	—	Dryer sized for +10°C PDP	—

Selecting Parker purification equipment to comply with older revisions of ISO8573-1

Should a user who's compressed air system has been specified in accordance with the 2001 edition of the standard require additional purification equipment the table below should be used.

ISO8573-1:2001 CLASS	Solid Particulate		Water	Oil
	Wet Particulate	Dry Particulate	Vapour	Total Oil (aerosol liquid and vapour)
0	—	—	—	OIL-X Grades AO (F) + AA (F) + OVR
1	OIL-X Grades AO (F) + AA (F) + TETPOR II	OIL-X Grades AO (M) + AA (M) + TETPOR II	Dryer sized for -70°C PDP	OIL-X Grades AO (F) + AA (F) + OVR OIL-X Grade AO (F) + AA (F) + ACS
2	OIL-X Grade AO (F) + AA (F)	OIL-X Grade AO (M) + AA (M)	Dryer sized for -40°C PDP	OIL-X Grades AO (F) + AA (F)
3	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for -20°C PDP	OIL-X Grade AO (F)
4	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for +3°C PDP	OIL-X Grade AO (F)
5	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for +7°C PDP	—
6	—	—	Dryer sized for +10°C PDP	—

Should a user who's compressed air system has been specified in accordance with the 1991 edition of the standard require additional purification equipment the table below should be used.

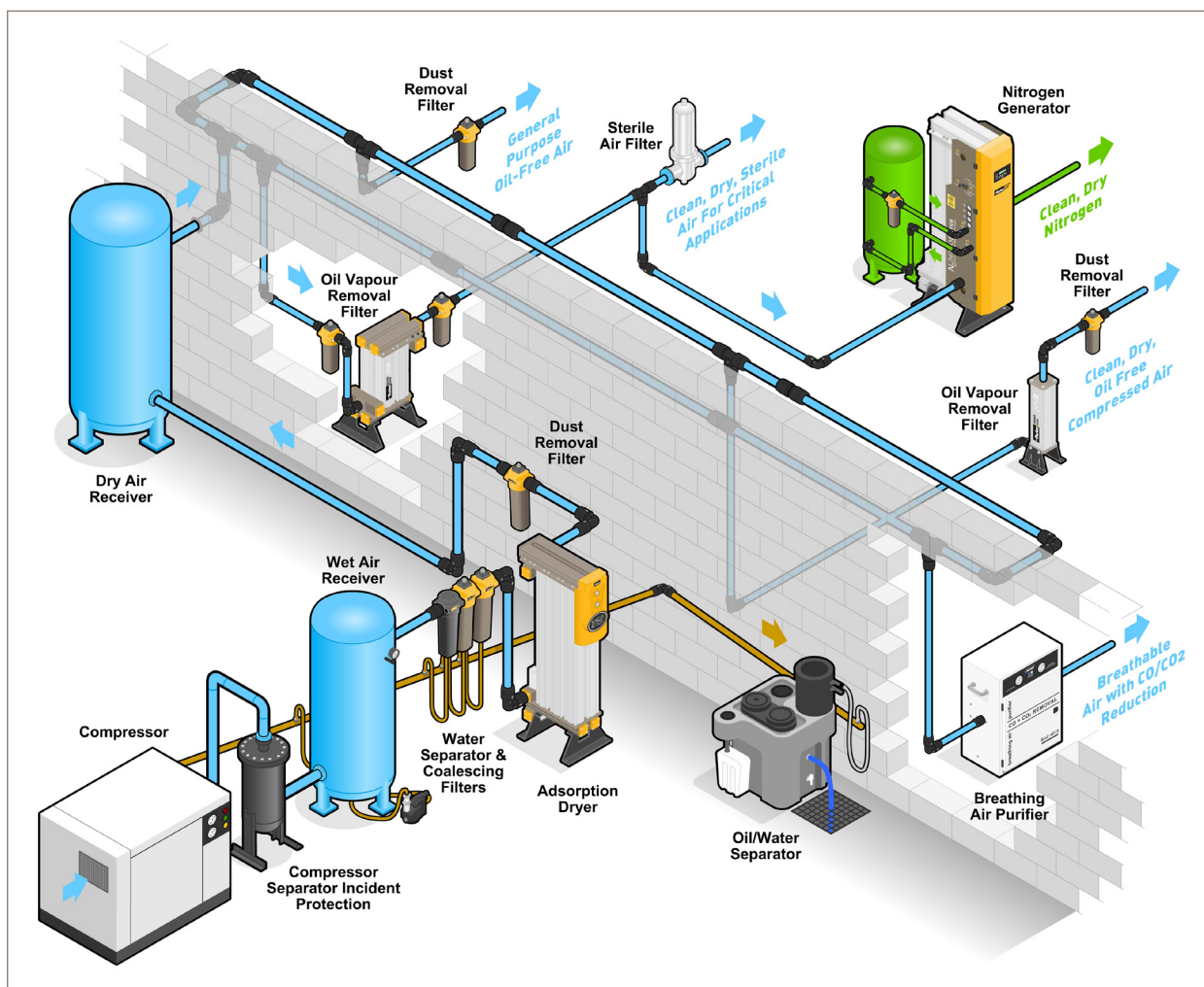
ISO8573-1:1991 CLASS	Solid Particulate		Water	Oil
	Wet Particulate	Dry Particulate	Vapour	Total Oil (aerosol liquid and vapour)
1	OIL-X Grades AO (F) + AA (F)	OIL-X Grades AO (M) + AA (M)	Dryer sized for -70°C PDP	OIL-X Grades AO (F) + AA (F) + OVR OIL-X Grade AO (F) + AA (F) + ACS
2	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for -40°C PDP	OIL-X Grades AO (F) + AA (F)
3	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for -20°C PDP	OIL-X Grade AO (F)
4	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for +3°C PDP	OIL-X Grade AO (F)
5	OIL-X Grade AO (F)	OIL-X Grade AO (M)	Dryer sized for +7°C PDP	—
6	—	—	Dryer sized for +10°C PDP	—

Optimised system design

The quality of air required throughout a typical compressed air system can vary.

The extensive range of purification equipment available from Parker allows the user to specify the quality of air for every application, from general purpose ring main protection, through to critical clean dry air (CDA) point of use systems.

Parker has comprehensive ranges of purification equipment available to exactly match system requirements, ensuring both capital and operational costs are kept to a minimum.



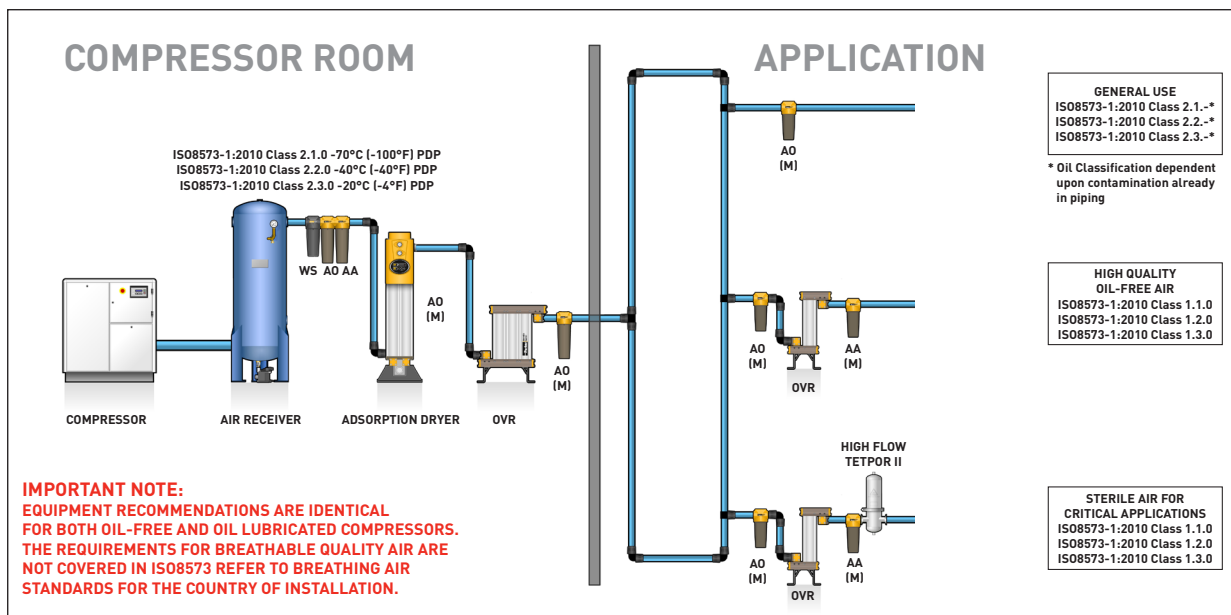
Cost effective system design

To achieve the stringent air quality levels required for today's modern production facilities, a careful approach to system design, commissioning and operation must be employed.

Treatment at one point alone is not enough and it is highly recommended that the compressed air is treated in the compressor room to a level that will provide general purpose air to the site and also protect the distribution piping.

Point of use purification should also be employed, not only to remove any contamination remaining in the distribution system, but also with specific attention on the quality of air required by each application. This approach to system design ensures that air is not 'over treated' and provides the most cost effective solution to high quality compressed air.

CRITICAL APPLICATIONS



Typical Applications

Direct contact / in-direct contact applications in

- Food manufacturing
- Beverage bottling
- Pharmaceutical manufacturing
- Dairies
- Breweries
- Wineries

Optical storage devices (CD, CD/RW, DVD, DVD/RW, BluRay)

Optical disk manufacturing (CD's/DVD's):

Hard disk manufacturing

Silicon wafer manufacturing

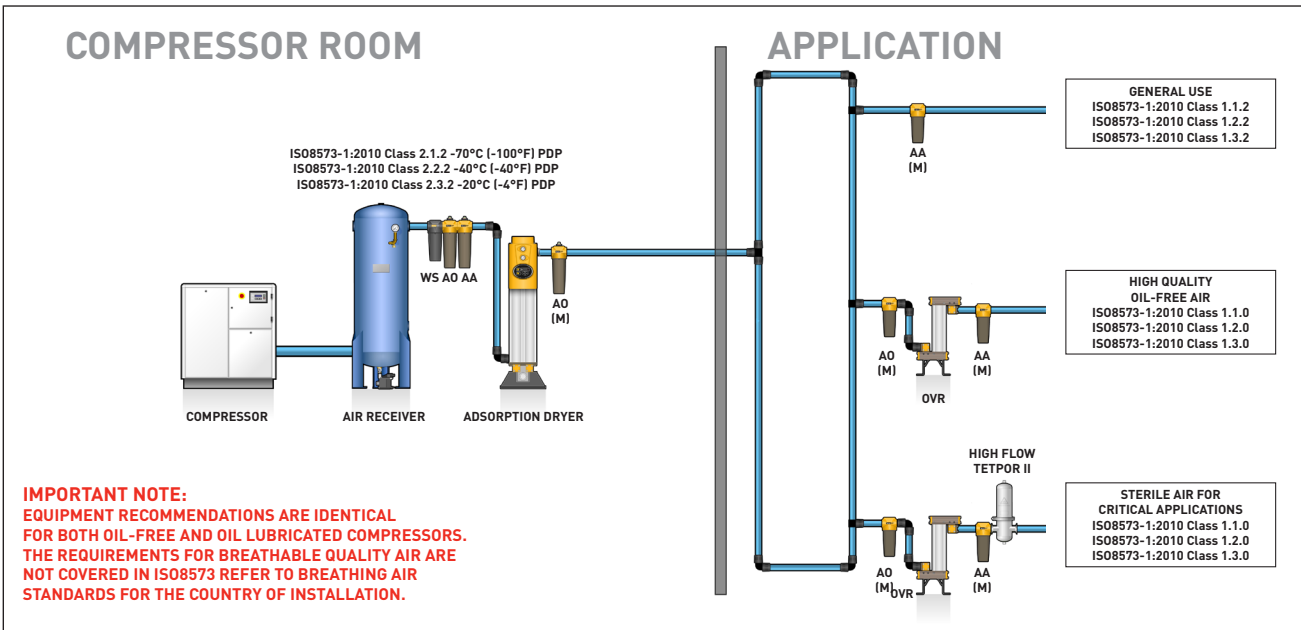
TFT / LCD / LED / OLED screen manufacturing

Memory device manufacturing

Optical storage devices (CD, CD/RW, DVD, DVD/RW, BluRay)

CDA systems for electronics manufacturing

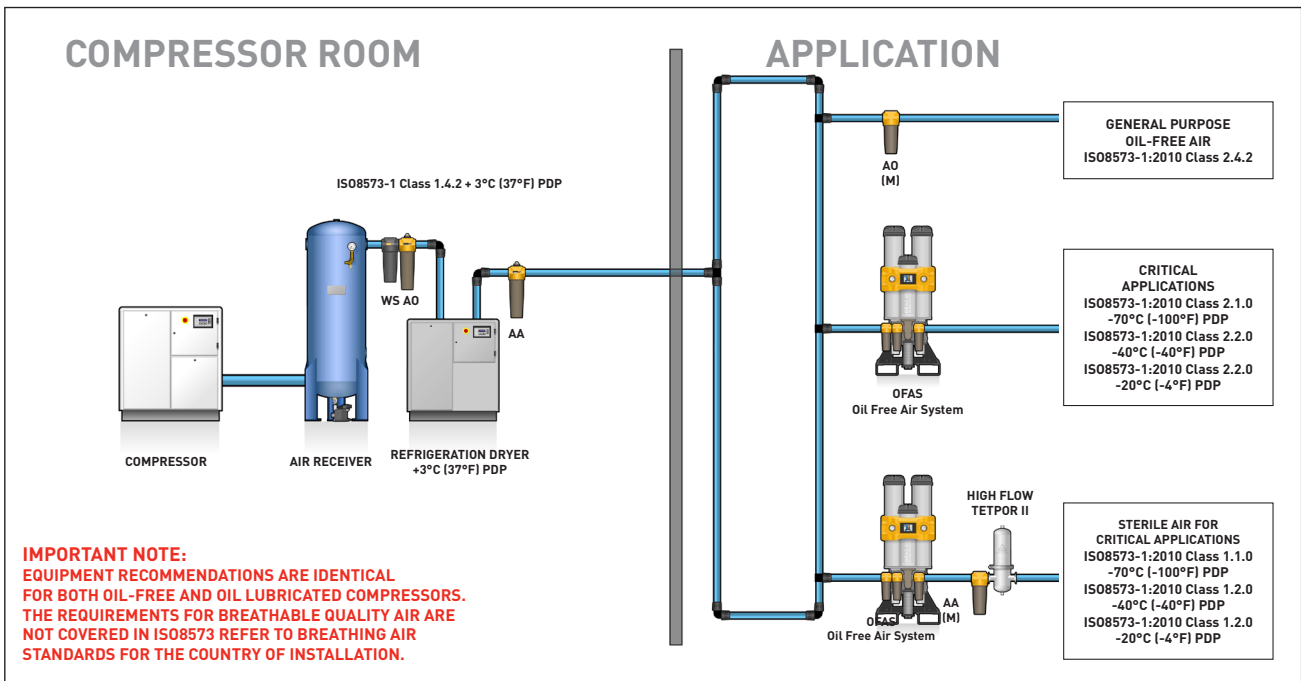
HIGH QUALITY OIL-FREE AIR



Typical Applications

- | | | |
|---|-------------------|--|
| Blow Moulding of Plastics e.g. P.E.T. Bottles | Medical air | Air bearings |
| Film processing | Dental air | Pipeline purging |
| Critical instrumentation | Lasers and optics | Measuring equipment |
| Advanced pneumatics | Robotics | Blanketing |
| Air blast circuit breakers | Spray painting | Modified Atmosphere Packaging |
| Decompression chambers | | Pre-treatment for on-site gas generation |
| Cosmetic production | | |

GENERAL PURPOSE AIR WITH OIL-FREE AIR FOR CRITICAL APPLICATIONS



Typical Applications

- | | | |
|--|--|-----------------------------|
| General ring main protection | General instrumentation | Workshop (Tools) |
| Pre-filtration to point of use adsorption air dryers | Metal stamping | Garage (Tyre filling) |
| Plant automation | Forging | Temperature control systems |
| Air logistics | General industrial assembly (no external pipework) | Blow guns |
| Pneumatic tools | Air conveying | Gauging equipment |
| | Air motors | Raw material mixing |
| | | Sand / bead blasting |

System Testing and Product Validation FAQ's

FAQ – How do I test a compressed air system to ensure purity is in accordance with ISO8573?

Testing of a compressed air supply to ascertain its air purity in accordance with any one of the 3 revisions of ISO8573-1 requires the tester to follow the methodology and use the equipment stated within ISO8573 parts 2 to 9.

Each contaminant is covered in a different part of the standard

ISO8573-2 - Test methods for oil aerosol content

ISO8573-3 - Test methods for the measurement of humidity

ISO8573-4 - Test methods for solid particulate content

ISO8573-5 - Test methods for oil vapour and organic solvent content

ISO8573-6 - Test methods for gaseous contaminant content

ISO8573-7 - Test methods for viable microbiological content

ISO8573-8 - Test methods for solid particle content by mass concentration

ISO8573-9 - Test methods for liquid water content

Important Notes:

- If the specific test methodology and test equipment stated in the above standards are not used, then the compressed air purity cannot be classified in accordance with ISO8573-1
- Failure to follow the test methodology and test equipment stated in the above standards will result in incorrect readings which may lead the tester/user to wrongly think the purification equipment is not working to specification
- Many manufacturers claim their test equipment is compliant with "ISO8573" when in fact it does not
- Test equipment should be compared to the specific ISO standard for the contaminant being tested for to ensure the technology is listed.
- Not all test equipment on the market will provide the required accuracy to classify compressed air in accordance with ISO8573-1.
- If the test equipment being used is not listed in the relevant ISO8573 standard, the compressed air cannot be classified in accordance with ISO8573-1

ISO 8573 Test Methodology

The most stringent classifications in ISO8573-1 require very accurate contaminant measurement in order to show compliance. To ensure this accuracy, ISO8573 standards Parts 2 to 9 concentrate on test methodology and equipment. When it comes to sampling, two flow methods are to be used (selected upon compressed air flow and velocity)

The two sampling methods are:

Full flow sampling
and
Partial flow or iso-kinetic sampling

These are explained in simple terms below.

Full flow sampling

Full flow is used where the compressed air flow rate at the sample point is less than or equal to the maximum sampling rate of the test equipment. This ensures the air velocity and therefore the contaminant concentration found in the compressed air pipe is matched in the test equipment.

Example of full flow sample method

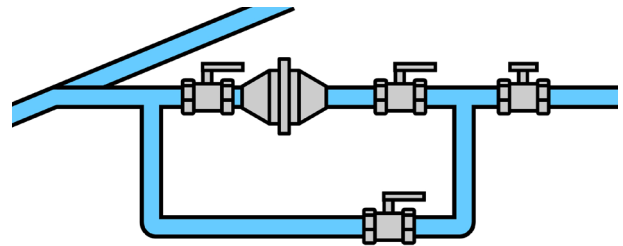
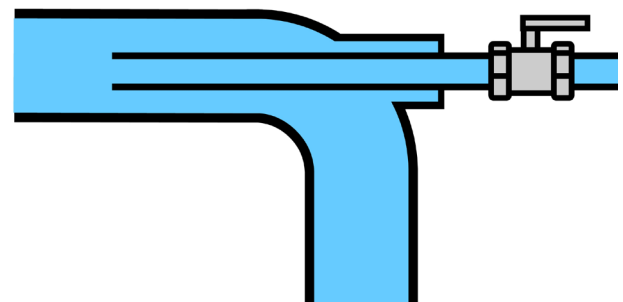


Image shows oil aerosol sampling equipment set up for full flow sampling

Partial flow sampling

Conversely, for large pipes with large compressed air flow rates, it is not possible to pass the entire flow through the test equipment, therefore partial flow or iso-kinetic sampling techniques are used. The iso-kinetic sampling method takes a smaller flow of compressed air from the larger pipe but whilst ensuring the velocity of the compressed air and therefore the contaminant concentration is matched in the test equipment. The sample probe is designed specifically for the test point at which it is to be used and for accuracy, must be designed using the criteria contained within the ISO8573 series standards.

Example of iso-kinetic sample method



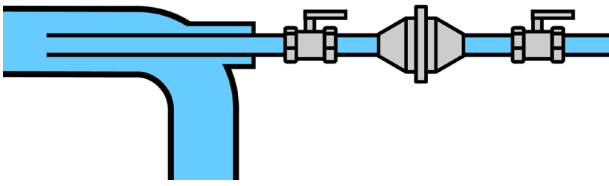


Image shows oil aerosol sampling equipment attached to iso-kinetic probe

Important Notes:

- Iso-kinetic sampling requires specific sampling points to be installed in a compressed air system and can be very costly.
- It is not uncommon for testing to be carried out at “T’s” fitted into the compressed air distribution piping.
- Whilst convenient and low cost, the problem with these sample points is that they do not match the air velocity and therefore the contaminant concentration found in the larger pipe / compressed air flow, leading to higher velocities, higher contaminant concentrations and inaccurate readings.
- If this type of sampling is used to test a compressed air system, the results cannot be used to classify the compressed air in accordance with ISO8673-1.

Example of “T-piece” used for sampling



A “T-piece” at the air receiver pressure gauge port or in compressed air system piping are common sample points but do not provide accurate samples to test equipment and therefore must not be used.

Understanding the test equipment required to test in accordance with ISO8573

Many users in critical industries are looking for monitoring equipment that will provide “real time” measurement of their compressed air purity and provide alarm notification whenever their air purity drops below their required ISO8573-1 classifications.

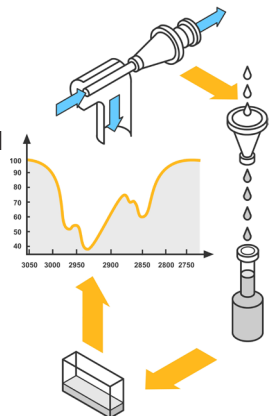
To answer this demand, manufacturers are now starting to claim their test equipment is compliant with “ISO8573” when in fact it is not. And whilst product literature, web sites and even the equipment itself may bare the logo of the international standards organisation and / or the relevant ISO8573 standard, ISO do not provide a facility for manufacturers to show compliance nor does it endorse any equipment.

ISO8573-1 splits contaminants into three main sub categories, those being solid particulate, water and total oil. In order to test for these contaminants however, more than one type of test may be required.

Oil

For example, total oil assumes that no liquid oil is present and then requires the detection and measurement of oil in 2 other phases, these being oil aerosol and oil vapour. This in turn requires the use of the test methods and equipment shown in ISO8573-2 for oil aerosol and ISO8573-5 for oil vapour.

Both these tests use differing sample collection equipment (membrane discs for aerosol and ADD tubes for vapour), both require a laboratory solvent extraction process and both require access to laboratory equipment (an FTIR spectrometer and a Gas Chromatograph) and of course trained personnel.



This type of testing is not “real time” and currently there are no “real time” measurement devices available that offer the accuracy required to classify compressed air in accordance with ISO8573-1 for total oil.

It is worth noting that there are “real time” oil analysers available on the market and these typically use photometry measurement techniques. Apart from their inaccuracy, the main failing with this technology is the inability to distinguish between a solid particle and an aerosol of oil or water.

Important Notes:

- If the equipment type is not listed in the relevant ISO standard it is not accurate enough to classify air in accordance with ISO8573-1.
- The international Standards Organisation (ISO) do not provide a facility for manufacturers to show equipment compliance with a standard nor does it endorse any equipment

System Testing and Product Validation FAQ's

Reference Conditions

ISO8573 standard reference conditions for gas volumes are as follows:

- **Air temperature 20 °C**
- **Absolute air pressure 100 kPa = [1 bar](a)**
- **Relative water vapour pressure 0**

Compressed air purification equipment designed to deliver air purity in accordance with the classifications shown in ISO8573-1 will typically show performance tested and rated at these reference conditions. Operation of the purification equipment at other conditions will potentially result in differing air purity to that shown at the reference conditions.

Dewpoint

Dewpoint (humidity) is the one contaminant that can be cost effectively measured in "real time". Whilst for true compliance with ISO8573-3 the measurement should be sampled using the test methodology highlighted within the standard, dewpoint can in fact be measured at most points in the system with reasonable accuracy using a "t-piece".

Particulate

As with oil sampling, it is extremely important when testing for particulates that the methodology of ISO8573-4 is followed, in particular iso-kinetic sampling. Failure to follow the methodology will typically lead to high velocities and high particulate concentrations. Additionally, the accuracy of the test equipment must be in line with the standard and for the higher particulate classifications, a laser particle counter is required. The equipment chosen must not only be capable of accurately measuring particle concentration in the range of 0 to 105, it must also be able to count particulate in the ranges of 0.1 to 5 micron.

Important notes:

- If the equipment is not listed in the relevant ISO standard it is not accurate enough to classify air in accordance with ISO8573-1.
- The international Standards Organisation (ISO) do not provide a facility for manufacturers to show equipment compliance with a standard nor does it endorse any equipment
- Accuracy of the sampling device
- Many low cost / portable sampling devices only go down to 0.3 micron. ISO8573-1 requires a particle count down to 0.1 micron

The main causes of high particulate count downstream of a compressed air filter are related to:

- Not using iso-kinetic sampling methodology, resulting in high velocities and high particle concentration
- The sample location, taking samples from piping downstream of a compressed air filter will often lead to high particle counts. This is not indicative of a failing filter but more the fact that the pipe and / or fittings is shedding particles
- Particle testing should be sampled at the outlet of a compressed air filter or efforts should be made to ensure piping between the outlet of the final filter and the application is clean, dry and particulate free
- Measurement at atmospheric pressure rather than at pressure
- Expansion of the compressed air prior to measurement increases air velocity and particle concentration
- Corrections should be made for pressure or use a high pressure diffuser
- The accuracy of the sampling device
- Many low cost / portable sampling devices only go down to 0.3 micron. ISO8573-1 requires a particle count down to 0.1 micron
- The humidity of the air being measured
- Photometers can detect aerosols of oil or water, therefore realistically particulate testing should always be downstream of a dryer
- Not understanding how a mechanical filter works
- Mechanical filters such as coalescing filters or dry particulate filters have an efficiency rating. This means that the more particulate that is presented to the filter, the more particulate will be passed downstream
- For 100% removal of particulate, a point of use absolute rated filter should be installed
- Vibration of / Disturbing Piping
- The actual process of sampling for particulate can often disturb particles leading to a higher than expected particle count
- Opening sample points can have a similar effect and sample points should be purged before samples are taken

FAQ – Validating Filter Performance

As modern production facilities improve their compressed air quality requirements, Parker are often asked to validate the performance of their compressed air purification equipment “in-situ”. As compressed air purification has been designed to provide a specific performance at the ISO8573-1 reference conditions, the delivered performance may vary from literature performance when tested in-situ.

Additionally, the cost and complexity of purchasing the test equipment and following the sampling methodology required to validate in accordance with ISO8573 parts 2 to 9 precludes this type of validation from being offered commercially and on-site. (Refer to this document for further information regarding the testing methodology & test equipment required)

In order to provide a measure of protection for the end user, Parker Hannifin OIL-X filter performance has been tested in accordance with the relevant parts of ISO12500 series (the international standard for the testing of compressed air filters) and independently 3rd party validated by Lloyds Register. Copies of validation certificates are available on request

FAQ – I need to test my compressed air system to show compliance, even if it’s not fully to ISO8573 (Indication v’s Validation)

In certain industries, the end user may be required to show some level of testing has been carried on their compressed air system and at a specific frequency to show compliance (for example as part of a Pre-Requisite Programme often used in the Food / Beverage / Pharmaceutical industries).

Whilst the cost and complexity of purchasing the test equipment and following the sampling methodology required to validate in accordance with ISO8573 parts 2 to 9 precludes full validation from being offered commercially. This however does not mean that indicative testing cannot be carried out to highlight any changes that may be happening to the air purity.

Examples of indicative testing available:

- Oil testing using chemical detector tubes / non iso-kinetic sampling
- Particulate testing using less accurate particle counters / non iso-kinetic sampling

Important notes:

- It must be stressed that this type of testing: Is for indicative purposes only
- Major changes in test results from one test to another may indicate a problem that would warrant further investigation
- Is not for product validation
- Product validation on-site is not commercially available
- Is not in accordance with ISO8573 parts 2 to 9
- Does not typically use iso-kinetic sampling methodology
- Does not use the test equipment started in the ISO8573 standards
- Will not allow the tester / user to show compliance with ISO8573-1 classifications
- Is not accurate

Focused on Compressed Air Treatment

To guarantee maximum performance and reliability, Parker compressed air treatment products protect the entire compressed air network, providing the best quality compressed air, exactly where it is needed.



**FOCUSED ON
FILTRATION AND
SEPARATION**



**FOCUSED ON
REFRIGERATION
AND COOLING**



**FOCUSED ON
ADSORPTION**

Parker Compressed Air Filtration Products



OIL-X Coalescing & Dry Particulate Filters



OVR Oil Vapour Removal Filters

Parker domnick hunter OIL-X filter range and Parker Zander dryer ranges have been designed to provide compressed air quality that meets or exceeds the levels shown in all editions of ISO8573-1, the international standard for air quality.

Filtration & dryer performance has also been independently verified by Lloyds Register.

Water separators

Water separator performance has been tested in accordance with ISO12500-4 and ISO8573-9.

Coalescing filters

Coalescing filter performance has been tested in accordance with ISO12500-1, ISO8573-2 and ISO8573-4.

Dry particulate filters

Dry particulate filter performance has been tested in accordance with ISO8573-4.

Oil vapour removal filters

Oil vapour removal filter performance has been tested in accordance with ISO8573-5.

Dryers

CDAS, OFAS, FBP, MX & MXLE dryer performance has been tested in accordance with ISO7183

In addition to performance validation, the materials used in the construction of the ranges recommended below for use in food and beverage manufacturing are FDA Title 21 Compliant and EC1935-2004 exempt. Certificates available on request.

Parker Compressed Air Drying Products



OFAS Oil Free Air System

MX Adsorption Dryer

MXLE Low Energy Adsorption Dryer

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates, Dubai
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