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Gas Separation and Filtration Division EMEA

CATALOGUE 2022

COMPRESSED AIR AND GAS TREATMENT

ENGINEERING YOUR SUCCESS.

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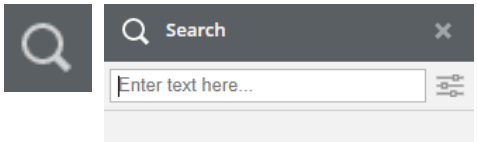


Gas Separation and Filtration Division EMEA

Parker Gas Separation and Filtration EMEA offer a range of filtration and separation solutions that are designed to meet the needs of global customers through a dedicated focus on key market sectors.

Operating from manufacturing sites in the UK, Italy, the Netherlands and the Czech Republic, the division designs, develops, manufactures and markets compressed air/gas filters and dryers, process chillers and coolers, condensate management products, breathing air purifiers, nitrogen, hydrogen and zero air on-site gas generators for many diverse markets, industries and applications where compressed air and gas purity, product quality, technological excellence and global customer support are paramount.

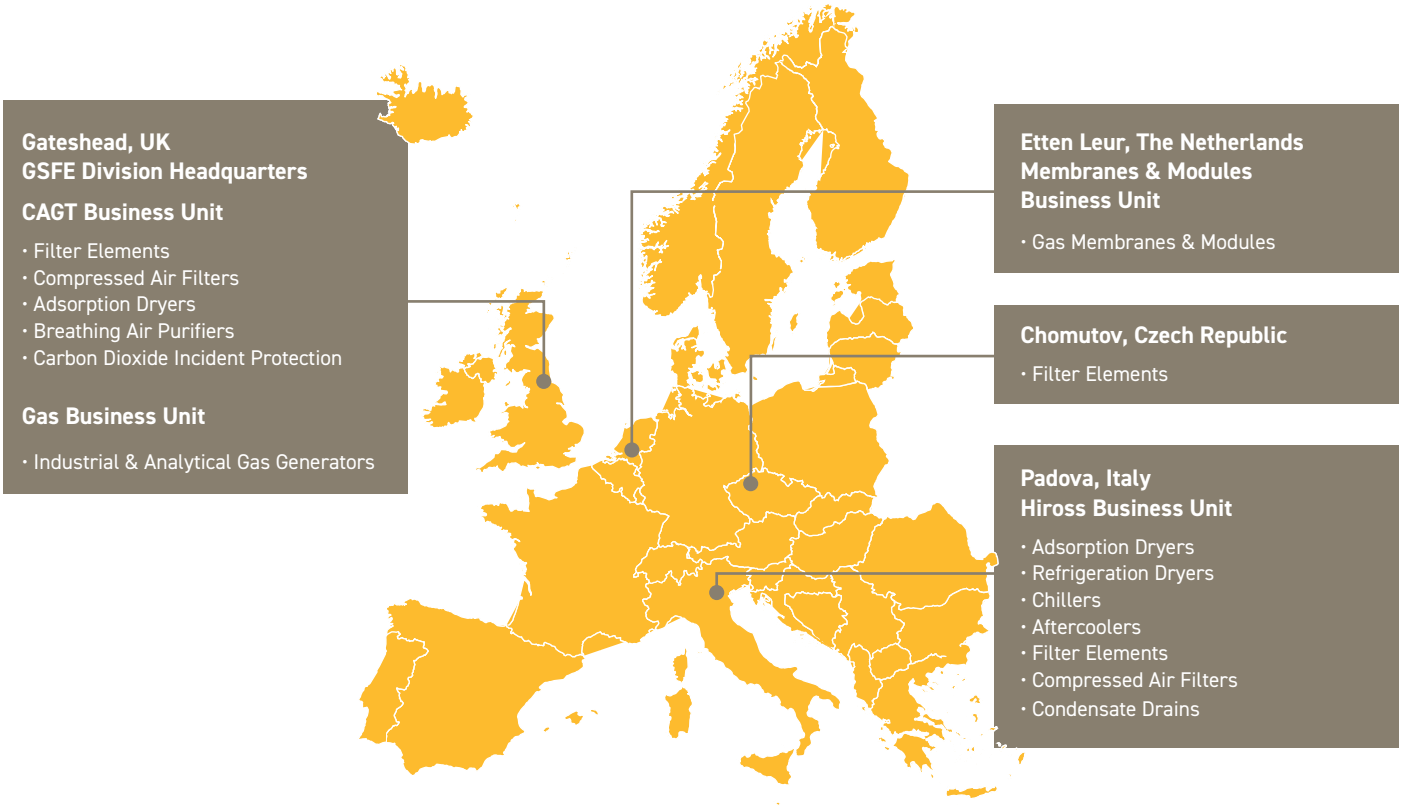
Parker Gas Separation and Filtration EMEA products and systems deliver a unique combination of innovation and excellence in the most demanding applications, helping engineers to maximise the productivity and profitability of their manufacturing and process operations and with a focus on delivering real and lasting value to every customer.

For over 50 years, Parker GSFE have remained instrumental in the development of both the international standards for compressed air and filter testing, and continue to work closely on new standards with governing bodies such as the British Compressed Air Society (BCAS), the International Standards Organisation (ISO), PNEUROP, and the USA Compressed Air and Gas Institute (CAGI).

Parker GSFE's goal is to dominate our chosen markets, aiming to be the number one choice supplier of compressed air / gas treatment products and on-site gas generators.

Achieving this, by recruiting the best teams, and by passionately developing our people, technology and products to help us exceed our customers' expectations, bringing new products, services and solutions to the market. We believe in, and strive to maintain, close relationships with our customers, making us their global partner of choice for compressed air and gas treatment products and services.

GSFE Compressed Air and Gas Treatment Manufacturing Locations



GSFE Compressed Air and Gas Treatment Technology Brands

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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, here all three contaminants are combined into one easy to use table.

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particulates per m³			Mass Concentration mg/m³	Vapour Pressure Dewpoint	Liquid g/m³	Total Oil (aerosol, liquid and vapour)
	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	-	≤ -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 an 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

- Class 0 does not mean zero contamination
- Class 0 does not mean oil-free compressed air
- A Class 0 compressor does not guarantee oil-free compressed air
- Class 0 does not solely refer to oil contamination
- A Class 0 specification must be 'cleaner' than the Class 1 specification for the contaminant chosen
- The contamination levels stated for a Class 0 specification must also be within the measurement capabilities of the test equipment and test methods shown in ISO8573 Pt 2 to Pt 9
- The Class 0 specification must clearly state which contaminant the Class 0 claim refers to i.e. "Solid Particulate", "Water" or "Total Oil (aerosol, liquid & vapour)"
- Class 0 requires the user or the equipment supplier to show a contamination level as part of a written specification
- **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)"
- The agreed Class 0 specification must be written on all documentation to be in accordance with the standard
- Stating Class 0 without an accompanying contaminant specification is meaningless and not in accordance with the standard

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, therefore you must first of all identify the quality of compressed air required for the compressed air leaving the compressor room and for each point of use on the compressed air system.

2. The air quality required at each point of use may differ dependent upon the application.

3. Using the quality classifications shown in ISO8573-1 will allow easy selection of purification equipment.

4. ISO8573-1:2010 is the latest edition of the standard, however some facilities may still be operating on older revisions.

5. 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.

6. Ensure any ISO8573-1 air purity classifications are written in full and include the revision year to allow for correct product selection.

7. Remember - Oil-free compressor installations require the same filtration considerations as oil lubricated compressor installations.

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

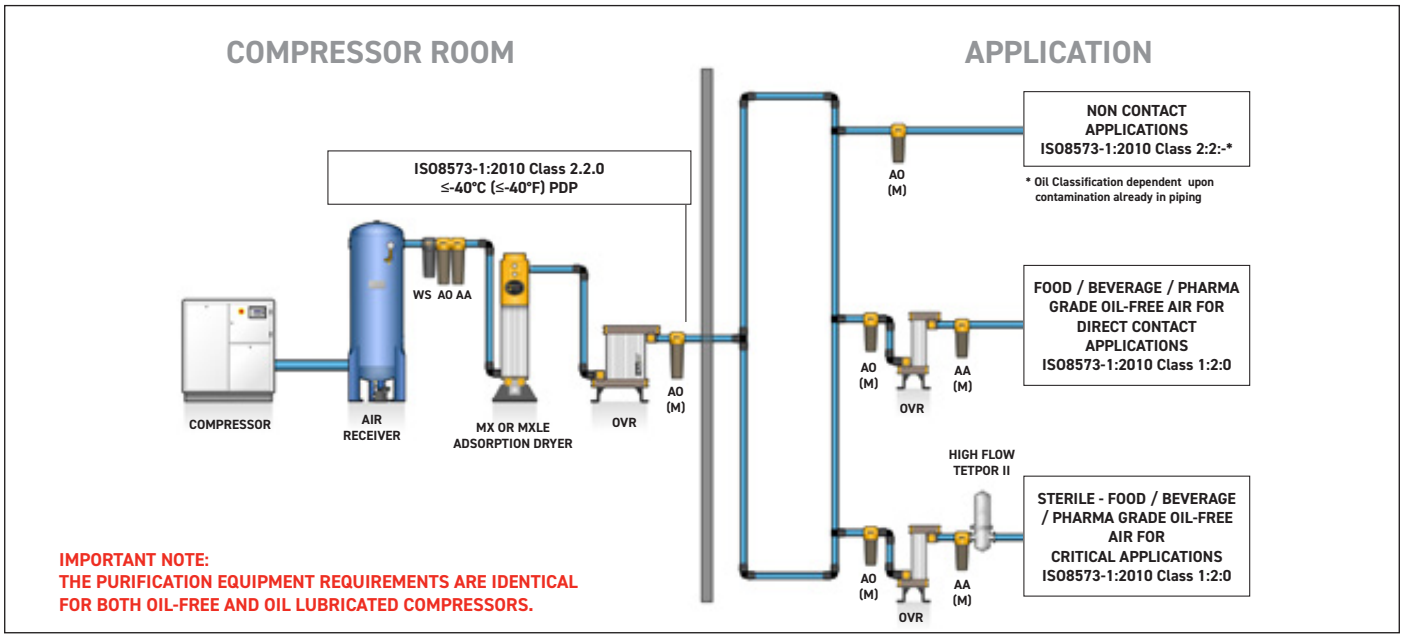
For further information relating to ISO Compressed Air Quality Standards please refer to our white paper 'Introduction to ISO Compressed Air Quality Standards'. Available at parker.com/gsfe

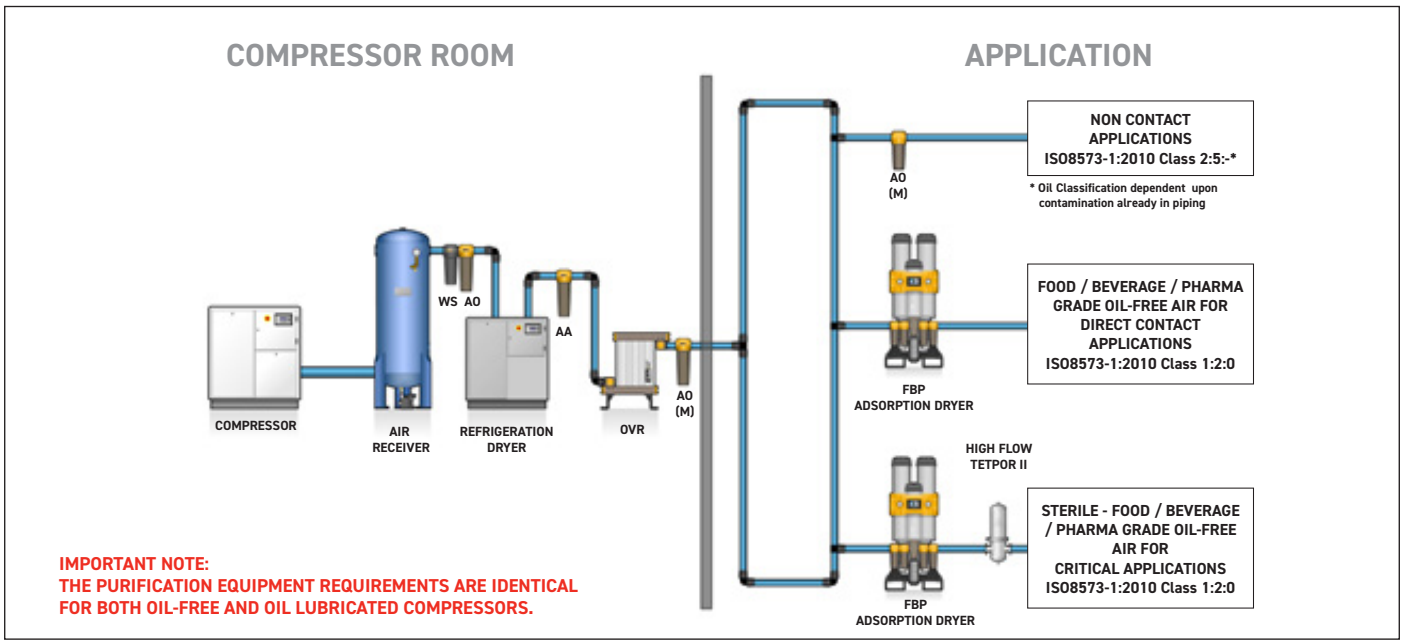
Cost effective system design

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.

FOOD / BEVERAGE / PHARMACEUTICAL - DIRECT CONTACT APPLICATIONS

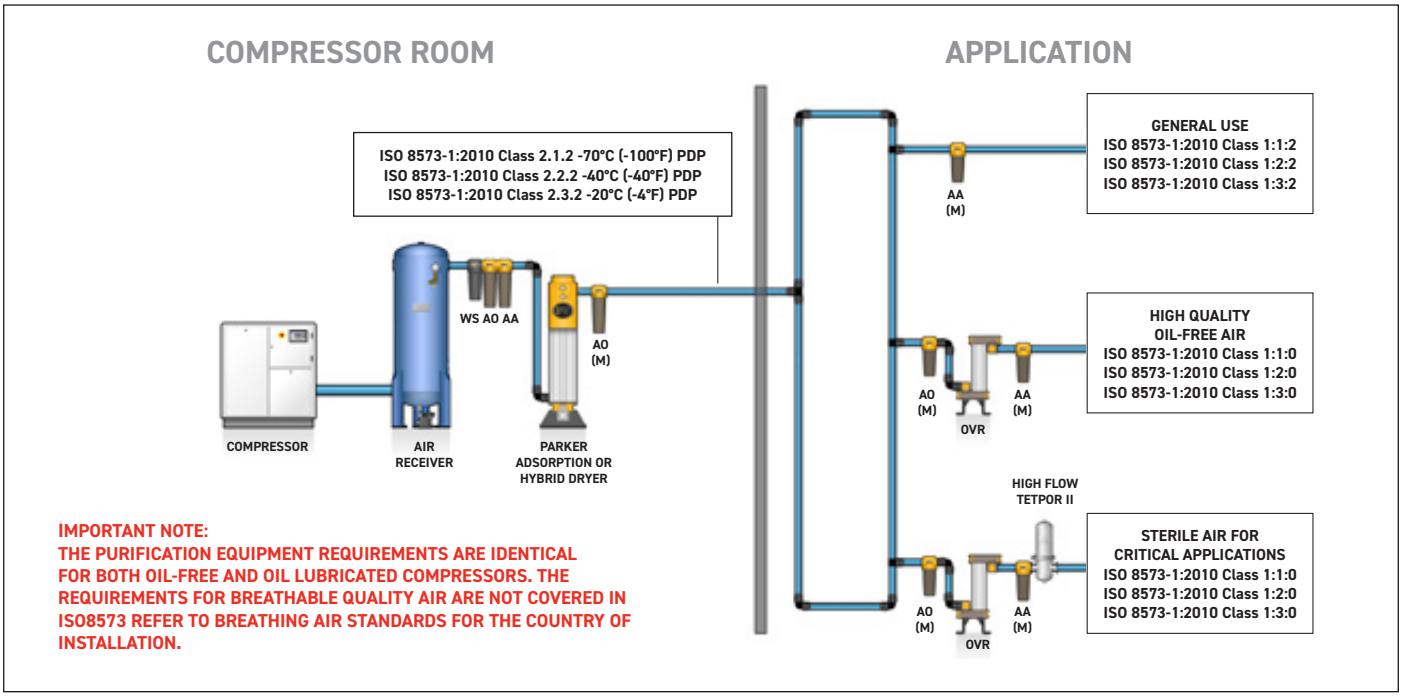




Typical Applications

Direct contact / in-direct contact applications in food manufacturing / beverage bottling / pharmaceutical manufacturing / dairies / breweries / wineries / distilleries (In accordance with BCAS Best Practice Guideline 102 Food & Beverage Grade Compressed Air).

HIGH QUALITY TECHNICALLY OIL-FREE AIR

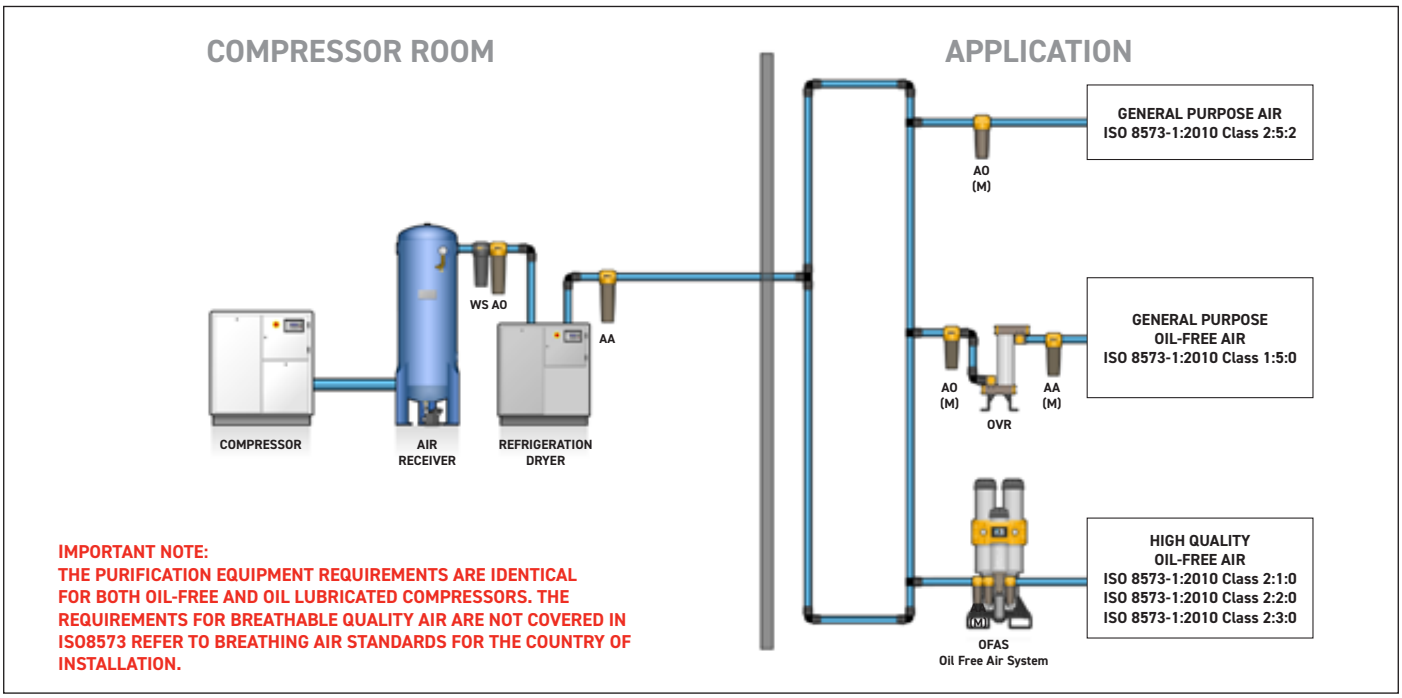


IMPORTANT NOTE:
THE PURIFICATION EQUIPMENT REQUIREMENTS ARE IDENTICAL FOR BOTH OIL-FREE AND OIL LUBRICATED COMPRESSORS. THE REQUIREMENTS FOR BREATHABLE QUALITY AIR ARE NOT COVERED IN ISO8573 REFER TO BREATHING AIR STANDARDS FOR THE COUNTRY OF INSTALLATION.

Typical Oil-Free Air Applications

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

GENERAL PURPOSE AIR WITH OIL-FREE AIR FOR CRITICAL APPLICATIONS



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Typical General Purpose Applications

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

Selecting the right purification products for your compressed air system

To achieve the degree of air quality specified by ISO8573-1, a careful approach to system design, commissioning and operation must be adopted.

Parker recommends that compressed air is treated:

- **Prior to entry into the distribution system**
- **At critical usage points and applications**

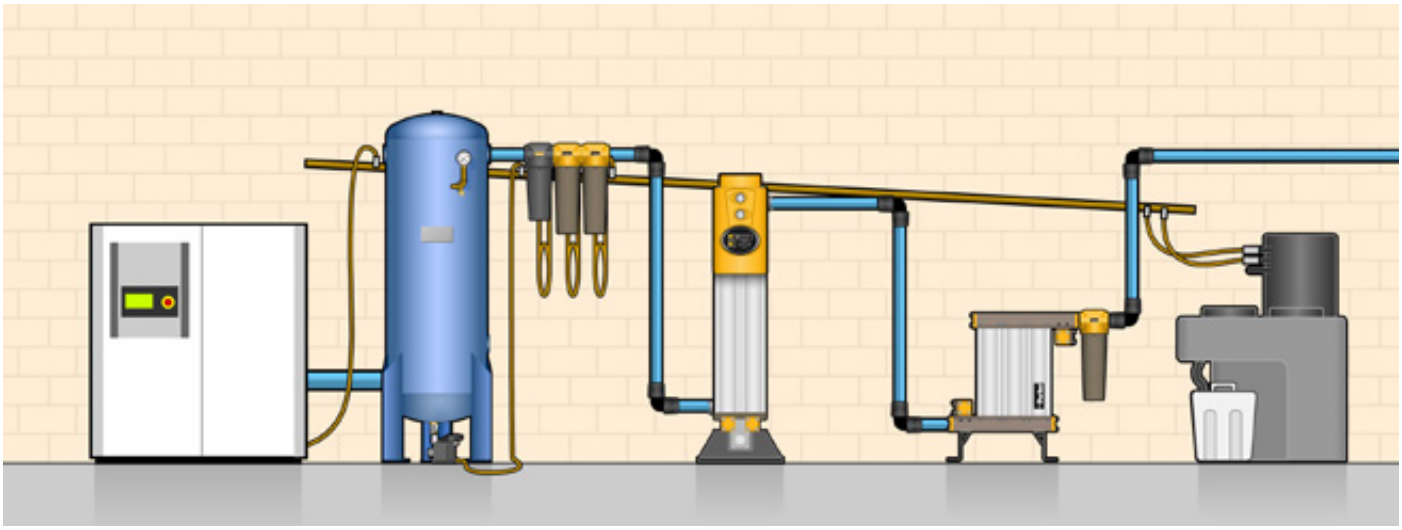
This ensures that contamination already in the distribution system is removed.

Purification equipment should be installed where the air is at the lowest possible temperature (i.e. downstream of after-coolers and air receivers). Point-of-use purification equipment should be installed as close as possible to the application.

In order to correctly size purification equipment, there are a number of primary operating parameters that must be obtained from the user's site. These are:

- **The MAXIMUM compressed air flow rate into the filters / dryer**
- **The MINIMUM operating pressure into the filters / dryer**
- **The MAXIMUM operating temperature into the filters / dryer**
- **The MAXIMUM ambient air temperature where the equipment is to be installed**
- **The required dewpoint (dryers)**

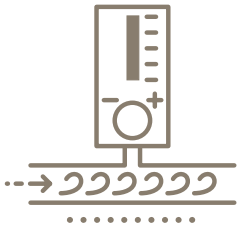
Individually, each of the primary operating parameters can influence product sizing however collectively they can have a major impact on product sizing and performance.



With the primary operating parameters, basic product selections can be made, however additional information may also be required to finalise product selection. Secondary parameters include:

- **Minimum operating temperature**
- **Preferred pipe connections**
- **Available electrical supply (voltage / phase / frequency)**
- **Customers preference regarding drains, controllers or other options**

Why is MAXIMUM Flow Rate Important?



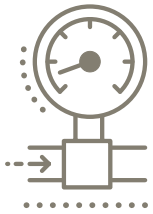
Filtration: As compressed air flow rates increase, contamination levels increase and a larger filtration surface area is required to ensure adequate filtration performance, low pressure drop and 12 month lifetime of filter elements.

Dryers: As compressed air flow rates increase, the amount of water vapour the dryer must remove also increases.

Adsorption dryers must be sized on the highest flow rate to ensure the desiccant bed is large enough to provide the correct contact time and dewpoint.

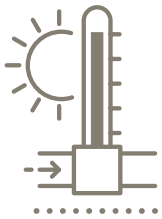
Refrigeration dryers must be sized to ensure the heat exchanger is large enough and has enough cooling capacity.

Why is MINIMUM Inlet Pressure Important?



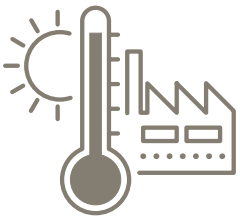
Dryers: As pressure decreases, the volume of compressed air increases, as does the water vapour content, therefore the amount of water vapour the dryer must remove also increases. Dryers must be sized for minimum inlet pressure to account for the increased amount of water vapour present.

Why is MAXIMUM Inlet Temperature Important?



Dryers: As the temperature of the compressed air increases, so does the water vapour content, therefore the amount of water vapour the dryer must remove also increases. Dryers must be sized for maximum inlet temperature to account for the increased amount of water vapour present.

Why is MAXIMUM Ambient Temperature Important?

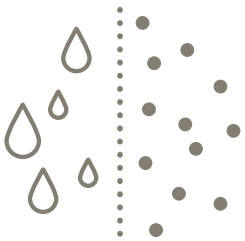


Refrigeration & Tandem Technology Dryers: Air cooled refrigeration & Tandem Technology dryers use ambient air for heat exchange.

The lower the ambient air temperature, the better the heat exchange process

Poor ventilation and / or high ambient air temperatures will result in loss of dewpoint.

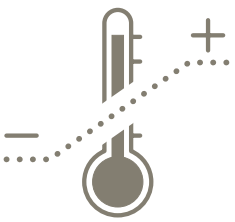
Why Correct a Dryer for Dewpoint?



Adsorption Dryers: Dewpoint is derived from contact time between the air and the desiccant material, lower dewpoints typically require the dryer to be de-rated to provide more contact time.

Refrigeration Dryers: The size of the heat exchangers affects the cooling capacity, too little cooling capacity results in poor dewpoint.

Frequently Asked Questions: High / Low Temperatures



High Temperatures
Maximum temperature (inlet & ambient) for dryers is 50°C or 122°F. For temperatures above this it is more cost effective to install an after-cooler than oversize a dryer. Also as a dryer increases in size, so does the volume of purge required to regenerate the dryer. Fitting an after-cooler is also more cost effective in terms of energy consumption.

Low Temperatures
Freezing water causes damage to a dryer therefore as the temperature approaches freezing, the dryer and ancillaries need protection. Sub-zero temperatures also affect the function of seals and electronics.

- **Always keep purification equipment under shelter and out of cold wind / direct air blasts**
- **Trace heat & insulate anywhere where moisture is present i.e. Inlet filtration / drain lines / Inlet valves / columns / exhaust valves**