TECHNICAL BULLETIN

BREATHABLE AIR QUALITY

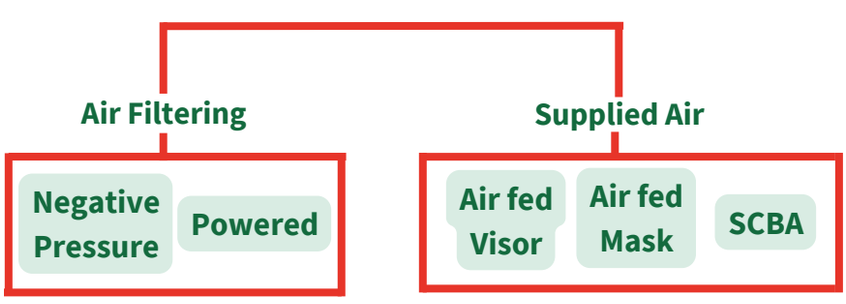
1.0 INTRODUCTION

By law, compressed air which is delivered to supplied air Respiratory Protective Equipment (RPE) should be regularly tested and be certified ‘BreathableQuality’. RPE can be split down into two main types:

1. AirFiltering RPE and
2. Supplied Air RPE (which includes Self Contained Breathing Apparatus (SCBA))

Maziak also provide a breathable Air Quality Testing Service

2.0 RPE FAMILY TREE



SUPPLIED AIR RPE

Supplied air RPE requires a supply of compressed air which can originate from two sources. Firstly, from a compressor (either mobile & fixed) as in the case of airfed or airline equipment and secondly, from a compressed air cylinder (or tank) as in the case of SCBA (Self-Contained Breathing Apparatus).

Compressed air is widely used throughout all major industries as a source of breathing air for applications such as paint spraying, fire fighting, and pharmaceutical operations.

Not surprisingly, the air that is delivered for respiratory use must be of good quality and is governed by stringent National Guidelines. The term used is ‘Breathable Quality’ Air.

3.0 BREATHABLE QUALITY AIR

WHAT IS BREATHABLE QUALITY AIR?

Breathable Quality Air is compressed air which is of a suitable quality to be inhaled by the user of a supplied air respirator. The air that is delivered for respiratory use is governed by stringent National Guidelines. In the UK these guidlines are laid out in a British Standard BS EN12021 2014 and HSE Guiance Note HS(G)53 “RPE - a practical guide for users”.

4.0 MAZIAK QUALITY TESTING SERVICE

Maziak offers an Air Quality Testing Service. This service is provided by trained engineers who specialise in air quality testing. You can arrange an air quality test by calling 01933222000, or by email to service@maziak.co.uk

On calling our Helpline and expressing an interest in an Air Quality Test, you will be transferred to our service desk which will arrange for a service engineer to call and test a representative number of sample points within your compressed air system. There is a standard charge which will be explained by our service desk. The results of the air analysis will be given on the same day of the test.

5.0 FREQUENTLY ASKED QUESTIONS AND ANSWERS

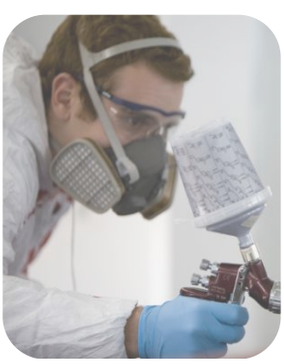
WHY TEST AIR FOR ‘BREATHABLE QUALITY’ IF THE SOURCE OF THE COMPRESSED AIR IS FROM NORMAL ATMOSPHERE?

Contaminants can enter the compressed air supply from either the compressor itself or from the surrounding contaminated air.

Under certain conditions, the oil lubricant in the compressor may breakdown due to high temperatures and produce carbon monoxide. Contamination of the air from the oil lubricants can deliver air with an unpleasant taste and odour. If this air remains contaminated with oil, the RPE users will suffer from nausea which may cause the users to stop wearing the RPE in the hazardous environment. Air containing oil may even ruin certain work surfaces e.g. paint finishes, leading to lost production. The manufacturer of the compressor can offer advice on whether the compressor is likely to generate certain contaminants into the air supply.

It is important to locate your compressor away from any potential airborne contaminants such as diesel fumes, vapours, gases and particulates. A compressor will draw in and compress whatever air is in its vicinity and if this air is near, for example, a car park, diesel fumes and carbon monoxide could be compressed and fed through to the breathing zone of the respirator wearer.





WHERE CAN I OBTAIN COPIES OF EN12021: 2014?

EN12021 : 2014 is availble from BSI (British Standard Institue), Chiswick, London.

IS PROVIDING BREATHABLE QUALITY AIR A LEGAL REQUIREMENT?

Yes. Regulation 9 of the Control of Substances Hazardous to Health Regulations (COSHH 1999) states that “where respiratory protective equipment (other than disposable respiratory protective equipment) is provided to meet the requirements of Regulation 7 (Prevention or Control of exposure to hazardous substances), the employer shall ensure that at suitable intervals thorough examinations and, where appropriate, tests of that equipment are carried out".

In the GeneralCOSHH Approved Code of Practice(ACOP) it states that:

*“In the case of airline-fed RPE, the volume and **quality** of the supplied air should be tested. A record of this test should also be kept”*

Therefore, if after conducting a risk assessment and having considered all other control measures, supplied air RPE is selected, this RPE should be maintained and relevant tests conducted. If the selected RPE is a supplied air device, an essential test should be an Air Quality test.

HOW OFTEN SHOULD A TEST BE COMPLETED?

The COSHH ACOP (Approved Code of Practice) states that tests should be made at least every month and more frequently where conditions are particularly severe. For occasional use and other such cases, suitable intervals should be determined by the person responsible for the management of all aspects of the maintenance of RPE, but in any event, the intervals should not exceed three months.

HOW WILL I KNOW IF THE AIR IS CONTAMINATED?

By regular testing and maintenance.

WHAT HAPPENS IF THE COMPRESSED AIR EQUIPMENT FAILS THE AIR QUALITY TEST?

This depends on which part of the test failed. Please see the table overleaf which compares UD+/QD+ filter device capabilities and BS EN12021 standard requirements.

For example, if you fail the oil mist category, a simple air filtration unit e.g. the UD+/QD+ filtration unit, could be incorporated into your system between the wearer and the compressor which removes oil mist to a level well within the specified limits. The UD+/QD+ Filtration unit does not however, remove carbon monoxide or carbon dioxide.

If you fail on carbon monoxide or carbon dioxide filtration the UD+/QD+ filtration unit cannot remove these contaminants and therefore, other filtration solutions will have to be evaluated. In these circumstances, we can still offer appropriate filtration advice, Please contact Maziak’s health and safety helpline for further advice.

ARE THERE ANY OTHER SPECIFICATIONS OF THE COMPRESSED AIR SUPPLY I NEED TO CHECK?

Yes. Supplied air RPE also requires air to be constantly provided at a certain pressure and flow rate. Not all compressors are guaranteed to be able to provide this pressure and flow constantly. Most compressors, as well as providing air to supplied air RPE, are also used to power compressedair tools or spray guns, so, advice from the compressor manufacturer should be sought to determine whether there is sufficient free air volume in the compressed air system to provide adequate air-pressure and flow rates constantly to all compressed air equipment.

HOW DO UD+/QD+ FILTRATION UNITS COMAPRE WITH THE REQUIREMENTS FOR BREATHABLE QUALITY AIR? ARE THERE CERTIAN CONTAMINANTS IT CANNOT REMOVE?

The tables below compares the requirements started in BS EN12021 with the capabilities of the UD+/QD+ filtration units.

These unites remove water and oil droplets, soilid particles and nuisance odours. It does not remove carbon monoxide, carbon dioxide or toxic vapours. It also does not monitor for oxygen content or water vapour. For this reason, there is still a requirement to check that the air will vbe within the specified limits of those substances it cannot remove.

The UD+/QD+ filtration units will however enhance air purity by further reducing certain contaminant concentrations in the air. The unit can therefore help provide the best quality air providing those contaminants it cannot remove, are withing the specified limits.

For example, the standard requires oil mist to be reduced to less than 0.5 mg/m3, yet the UD+/QD+ filtration unit further reduces the oil mist to less than 0.1mg/m3 - i.e much lower than the standard. For a data sheet on the UD+/QD+ system, please call our helpline.

	Breathable qaulity air	
Substance	**BS EN12021**	**UD+/QD+ Filtration Unit**
Oxygen	20-22% by volume	no capability to check
Carbon Monoxide	< 15ppm	no capability to filter
Carbon Dioxide	< 500ppm	no capability to filter
Oil mist/lubricants	< 0.5mg/m3	less than 0.01mg/m3
Odour/taste	without significant odour/taste	removes majority of vapours & odours down to 0.003ppm
Other contamenants	no substance above national exposure limit and should be kept to as low a level as possible	removes majority of vapours & odours down to 0.003ppm, removes particulates down to 0.1mg/m3
Water (liquid)	no free liquid water should be present	removes water droplets down to 5 microns in size and to a conentration down to 0.01mg.m3
Water (vapour)	air up to 40 bar for compressed airfed RPE should have a pressure dew point sufficiently low enough to prevent condensation and freezing. Where the RPE is used and stored at known temperature, the pressure due point should be at least 5 ‘C below the lowest likley temperature. If the use and storage temperature of air supply is not known, the pressure dew point should not exceed -11 ’C. For air between 40 bar and 200 bar, the water content should not exceed 50 mg/m3. For aire above 200 bar, the water content should not exceed 35 mg/m3.	not applicable
Particulates	no substance above national exposure limit and should be kept to as low a level as possible	removes down to 0.1mg/m3

Full details can be found in BS EN12021 available from BSI, Chiswick

These details are provided for guidance purposes only. Always refer to manufacturer instructions for Use and Safety information

6.0 FOR GUARANTEED CO AND CO2 REMOVAL WE RECOMMEND

High-quality air is of vital importance to many industries but even more so in breathing air applications. Atlas Copco BAP/BAP+ Breathing Air Purifiers are designed to offer protection against a range of contaminants that may be present in a compressed air-fed breathing system. These include fumes, oil, vapours, gases, solid particles and micro-organisms. Complying with International Breathing Air standards, the BAP/BAP+ Breathing Air Purifier range assures a safe working environment in a wide range of applications

BREATHING AIR APPLICATIONS:

- Shot-blasting
- Tank Cleaning
- Tunnelling
- Pharmaceutical manufacturing
- Spray painting
- Offshore/marine
- Asbestos removal
- High-pressure cylinder filling

INNOVATION

The breathing air purifier is fitted with a patented purge nozzle design with multiple orifice sizes*, enabling the purge rate to be adjusted to suit customer requirement, instead of delivering a set of fixed nozzles.

COMPACT OPERATION

Through clever component positioning, the BAP/BAP+ fits into any space or setting. It comes pre-assembled and ready for use, ensuring minimal installation and cost.

ENERGY EFFICIENCY

The BAP/BAP+ series incorporates state-of-the-art- energy management control with built-in purge control* as standard (optionally on the BAP series). The saver stops the purge flow when the dew point level remins low, leading to a more efficient use of energy

*The patented purge nozzle and purge control are not availbale on the BAP12-17.