

## BREATHING AIR

**Breathing Air** - The provision of breathable air to be used by a person in the execution of a work related task is controlled by certain legal requirements.

### Legal requirements

These requirements are contained variously in the following non-exhaustive listing;

**Management of Health and Safety at Work Regulations 1999 (SI 1999/3242)** – requires a safe working environment by the application of risk assessment procedures.

**The Personal Protective Equipment Regulations 2002 (SI 2002/1144) Schedule 2** - refers to the design and manufacturer of respiratory protective equipment.

**The Work in Compressed Air Regulations 1996 (SI 1996/1656)** - these regulations deal with those aspects where the user is operating in a pressure higher than atmospheric, e.g. tunnelling.

**Control of Substances Hazardous to Health (COSHH) Regulations 2002 (SI 2002/2677)** (also as amended by S.I. 2004 No. 3386 in respect of term "workplace exposure limit") - these regulations identify the maximum exposure limits for a defined list of contaminants which may be present in a workplace atmosphere. The exposure limits are now identified by the single term "workplace exposure limit (WEL)" which encompasses both Long and Short Term Exposure. Related to COSHH is a reference listing published annually under the identity **EH40 "Occupational Exposure Limits"**. The listings are in addition to those in COSHH. Where any doubt exists as to the limits for any contaminant then this should be used as a start point.

### Standards

The most commonly specified standard for the prescription of breathable air was BS 4275:1997 "Guide to implementing an effective respiratory protective device programme" **which was withdrawn on 22 November 2005**. This was then replaced on that date by **BS EN 529:2005 Respiratory protective devices. Recommendations for selection, use, care and maintenance. Guidance document**. Unlike BS 4275 the new standard BS EN 529 does not identify an air purity specification but indicates in Annex A, Clause 4.5 that reference be made to BS EN 12021.

**BS EN 12021 "Respiratory equipment - Compressed gases for breathing apparatus"** is now the only standard to indicate contaminant levels for breathing air both in the UK and in the EU.

Substance	Extract from BS EN 12021:2014 - Clause 6.
<b>Contaminants</b>	Compressed gas for breathing shall not contain contaminants at a concentration which can cause toxic or harmful effects. In any event, all contaminants shall be kept to as low a level as possible and shall be less than one tenth of a national 8 h exposure limit. For breathing air only the limit shall be less than one sixth of a national 8 h exposure limit. (WEL – See EH40)
Oxygen	(21 ± 1) % by volume (dry air)
Carbon monoxide	≤ 5ml/m <sup>3</sup> (now at the same level as was formerly indicated in BS 4275)
Carbon dioxide	500ml/m <sup>3</sup>
Oil	0,5 mg/m <sup>3</sup> (previously identified as lubricants [droplets or mist])
Odour/taste	Shall be free from unsatisfactory odour or taste
Water	See Note 1 and 2 - (Previously stated as "There shall be no free liquid water")
Note 1 - Compressed breathing air shall have a dew point sufficiently low to prevent condensation and freezing. Where the apparatus is used and stored at a known temperature the pressure dew point shall be at least 5 °C below the likely lowest temperature.	
Note 2 - Where the conditions of usage and storage of any compressed air supply is not known the pressure dew point shall not exceed -11 °C.	

**Measurement** - For the measurement of any or all of the contaminants reference should be made to the ISO 8573 series. The series identifies measurement methods, some of which can be done on-site and others require samples to be taken and the test performed in a laboratory.

### COSHH – Code of Practice - L5 (Sixth edition)

#### Clause 180 - Frequency of examination and tests – Extract

The frequency of examinations or tests should also be linked to the type of engineering control in use, the extent of any risk in the event of its failure or deterioration, and the likelihood that failure or deterioration will occur.

#### Clause 192 - Respiratory protective equipment – Extract (No longer refers to specific intervals)

The quality of the air supplied to breathing apparatus should be tested at suitable intervals, depending on the task and the frequency of use. As it is not reasonably practicable to test for all contaminants, the risk assessment made under regulation 6 should guide what other contaminants will require testing for.

#### Mobile compressor supply (Extract Clause 192)

When the air supply is from mobile compressors, the employer should ensure that, wherever a compressor is located, the quality of air it supplies is not compromised by nearby contaminants. In every case, the air supplied to breathing apparatus should meet the relevant quality standard.