



# 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;

**Personal Protective Equipment At Work 2015 (L25 Third Edition)** – this HSE publication provides guidance on the Personal Protective Equipment at Work Regulations 1992, which include provisions for respiratory protective equipment.

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

**The Control of Substances Hazardous to Health Regulations 2002** – 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 in the UK 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 EH40/2005 (Third Edition published 2018) 'Occupational Exposure Limits'. The listings are in addition to those in COSHH and where any doubt exists as to the limits for any contaminant then this should be used as a starting point.

## Standards

Suitable equipment and arrangements are detailed in BS EN 529:2005 'Respiratory protective devices. Recommendations for selection, use, care and maintenance.'

The specified standard for breathable air is BS EN 12021:2014 'Respiratory equipment. Compressed gases for breathing apparatus.'

Extract from BS EN 12021 – Clause 6 Requirements

*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 as low 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 8h exposure limit. For breathing at hyperbaric pressures greater than 10 bar or exposure times greater than 8h levels shall be revised to take into account the effects of pressure and exposure times.*

Oxygen	(21 ± 1) % by volume	Carbon dioxide	≤ 500ml m <sup>-3</sup> (ppm)
Carbon monoxide	≤ 5ml m <sup>-3</sup> (ppm)	Oil	≤ 0.5 mg m <sup>-3</sup>
Water (vapour) for supplied breathing air up to 40 bar	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. Where the conditions of usage and storage of any compressed air supply is not known the pressure dew point shall not exceed -11 °C		
Water (vapour) content of high pressure breathing air	Nominal maximum supply pressure bar	Maximum water content of air at atmospheric pressure mg m <sup>-3</sup>	
	40 to 200	≤ 50	
	>200	≤ 35	
	The water content of the air supplied by the compressor for filling 200 bar or 300 bar cylinders should not exceed 25 mg m <sup>-3</sup>		
Odour /Taste	The gas shall be free from unsatisfactory odour or taste		

Further information can be obtained from BCAS.

The UK National Annex NA to EN 12021:2014 under clause NA.4.2 states: "Samples should be taken and analysed at least every three months or more frequently if there has been a change in, or concerns relating to, the production process." Under COSHH - The quality of the air supplied to breathing apparatus should be tested at suitable intervals, depending on the task and the frequency of use.

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. 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.