



**factair**

# Confined Space

**VENTILATION SOLUTIONS**

PROTECTING LIFE IN HAZARDOUS ENVIRONMENTS



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Space

[www.factair.co.uk](http://www.factair.co.uk)

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CONFINED SPACE VENTILATION SYSTEMS

# Introduction

Confined spaces come in all shapes and sizes from those just big enough for a single person to squeeze into, to railway tunnels several kilometres long. Their definition as a confined space depends on the difficulty for access and egress and on the nature of the activity being undertaken within them. Frequently these spaces will require some form of ventilation to create a safe working environment.

Factair provides solutions for ventilating these spaces with a comprehensive and flexible range of systems available for sale, hire and project managed solutions. These solutions can range in scale from single axial fans to completely managed temporary systems for railway tunnel track renewal projects.

This brochure provides an overview on Factair's systems available for sale, hire and managed projects together with associated personal protective devices such as gas detectors and battery powered respirators.

For the more complicated projects Factair also provides a complete design and installation service. This begins with a site assessment to correctly size an appropriate ventilation scheme. Ventilation systems are designed to minimise the risk that arises when pollution levels identified in EH40/2005 Workplace Exposure Limits are exceeded. These projects incorporate a team of on site engineers to both deploy and maintain the equipment, as well as regularly monitoring the environment within the workspace.

The ventilation scheme is then delivered to site with options available for Factair's engineers to install and maintain the equipment round the clock. In addition, Factair's engineers can also provide regular environmental condition monitoring in the workspace to ensure a safe breathable environment is being maintained. At the end of these projects a detailed environmental report on the atmospheric conditions within the confined space is provided.

Factair is able to provide bespoke ventilation solutions to suit each customer's confined space because it has an incredibly diverse range of ventilation systems, these range from small hand held blowers to 1200mm diameter fans. The fans are available in several formats which include 110V, 415V and compressed-air driven, several of these have also been specifically designed for intrinsically safe applications. To ensure the correct airflow distribution each fan can also be supplied with matching non compressible wire reinforced anti-static ducting as well as conventional 'layflat' ducting.



# Ventilation Systems

Engineering work within confined spaces, including disused tunnels, can frequently generate levels of dust and pollution, which exceed the Workplace Exposure Limits listed in HSE document EH40. These spaces can also present their own inherent biological hazards that must be considered when designing a suitable ventilation scheme and safe system of work.

Factair has extensive experience in the design of innovative ventilation systems. The company has developed and installed a varied range of temporary systems at a diverse number of locations including:- London Underground, theatres, disused tunnels and underground fuel tanks.

Whatever form your confined space comes in Factair can help you develop a safe system of work. For the more complicated projects this includes an initial site survey to assess the hazards and potential pollutants present. When this assessment is combined with the activities being undertaken in the space, the number of air changes required per hour can be established.

Factair can provide equipment on a hire only basis or as a complete installed set-up. The equipment in the range includes:-

## ELECTRICALLY POWERED VENTILATION FANS

Factair has a comprehensive selection of ventilation fans available for both sale or hire. These range from 300mm, 110V to 1200mm, 380/415V all available with matching wire reinforced anti-static ducting.

## COMPRESSED-AIR POWERED VENTILATION

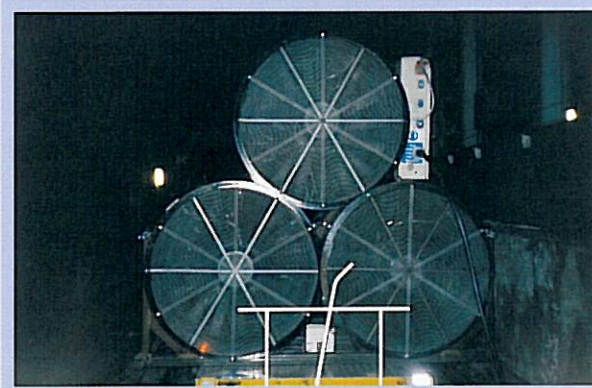
Where electrical power is not available or for intrinsically safe requirements, Factair offers air movers and compressed-air driven fans for either sale or hire. These air movers range from 75 to 225mm whilst the fans are available in 300 or 600mm diameter sizes.

## ATEX VENTILATION SOLUTIONS

As well as intrinsically air powered fans Factair offers 300mm Zone 1 electrical fans. These robust units are constructed from 304 stainless steel and feature an innovative carrying handle that helps to protect the STAHL isolator. All units are also fitted with a 5m electrical cable and STAHL plug as standard.



1200mm Diameter Electric Powered Fans



1000mm Diameter Fans In Sub-Surface Railway Tunnel



600mm Diameter Compressed-Air Powered Fan

# Railway Tunnel Temporary Ventilation

When designing a safe system of work within railway tunnels, there are special conditions to be considered in respect of the renewal and maintenance activities. Frequently locomotives, generators, diggers and bulldozers can all be operating within the same confined space. In addition, activities such as ballast changing often creates excessive levels of dust which need to be cleared from the work site.

Factair has been providing temporary tunnel ventilation systems to the rail industry since 1992. This complete service is purpose designed for each project, including deployment on site and regular environmental condition reporting in the tunnel.

Factair's systems have been designed so they can be rapidly deployable with minimal disruption to Contractors. Wherever possible fans are deployed outside the tunnel adjacent to the portal, thus causing no obstruction to traffic, or adding additional pollution from the generators.

The latest modular fans each produce over 78,000 cubic metres per hour of air and every array is mounted on a ring-bearing turntable which can be rotated by hand. This allows airflow direction to be quickly changed should prevailing conditions or obstructions block the airflow.

For tunnels which require additional ventilation, Factair provides trailer mounted ventilation systems, with an integral hydraulic system, allowing their height to be adjusted to suit the tunnel and avoid obstructions during deployment. These fans are especially useful for longer length railway tunnels and those, which contain vertical ventilation shafts as they ensure air is being moved along its whole length and not just locally.

On each project a team of engineers stays on site in order to check the equipment remains operational; it regularly tests the atmospheric conditions within the tunnel, ensuring levels remain within EH40 limits.

For key members of staff, such as machine drivers, machine controllers and COSS's Factair also provides data logging gas detectors.

Additionally, for those exposed to high levels of dust, such as ballast changing operations, or for personnel that have an asthmatic condition, Factair also provides battery powered air fed respirators; further details on both these and the gas detectors are detailed on the next page.



Ventilation Fans Deployed at Patchway Tunnel



Trailer Mounted Ventilation Fans Deployed at Foxhill Tunnel



Ventilation Fans Deployed at Bleamoor Tunnel

# Enhanced Personal Protection

To complement Factair's ventilation system, a comprehensive range of options is available to enhance personal protection against atmospheric hazards. These can be provided as an additional protection for workers or for projects where a complete temporary ventilation system may not be necessary.

## ON SITE AIR QUALITY TESTING

As standard on all managed projects, and also available as a stand-alone service, Factair's engineers can provide regular on site air quality testing. They test for a comprehensive range of contaminants and would notify those working within the confined space when levels begin to approach or exceed statutory limits. This allows workers to move to a place of safety until the engineers confirm that the atmospheric conditions have improved to a point where it is safe to resume work. Further details on the contaminants tested and the environmental condition reports available are detailed on the following page.

## PERSONAL GAS DETECTORS

Factair's large fleet of gas detectors is available to establish levels of pollutants including carbon monoxide, nitrogen monoxide and nitrogen dioxide. The latest units also provide data logging facilities which can be downloaded at the end of the hire and be compiled into an atmospheric condition report.

## BATTERY POWERED AIR FED RESPIRATORS

For dustier applications Factair offers lightweight, battery powered, air fed respirators with a PF20 protection factor. These devices provide a filtered source of breathing air to a face mask which incorporates head, eye and ear protection. During high ambient temperatures the masks provide a more comfortable working environment for the user with air being passed continuously over the face.

## ESCAPE SETS, HARNESSES AND WINCHES

To provide a full confined space entry solution Factair also offers a complete range of 10 minute BA escape sets, BA working sets, tripods and winches for hire.

## MOBILE BREATHING-AIR SYSTEMS

For applications where ventilation alone is not sufficient Factair also offers, for sale or hire, a comprehensive range of mobile breathing-air compressors and long duration cylinder sets, all with matching breathing-air hoses and masks.



Factair's engineers measuring atmospheric conditions



Datalogging Personal Gas Detector

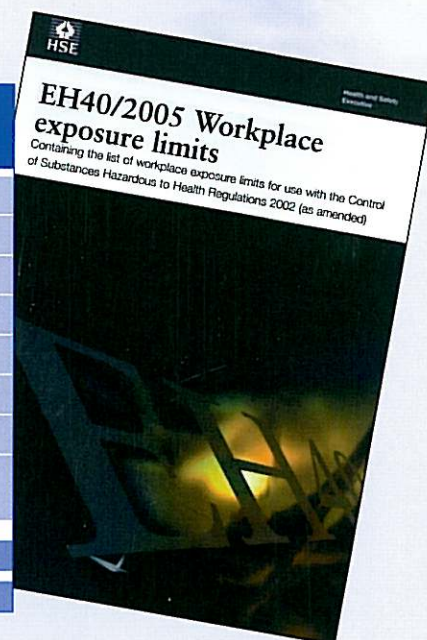


Engineer wearing battery powered air fed respirator

# Atmospheric & Noise Condition Reporting

With all managed projects Factair can offer environmental condition reporting throughout the project. On completion of the contract this data is compiled into a report, available in both paper and electronic format, and submitted to the client. These reports provide documentary evidence to the client that they have ensured a duty of care to both their own staff and sub-contractors working in the confined space. As standard the contaminants and limits measured include:-

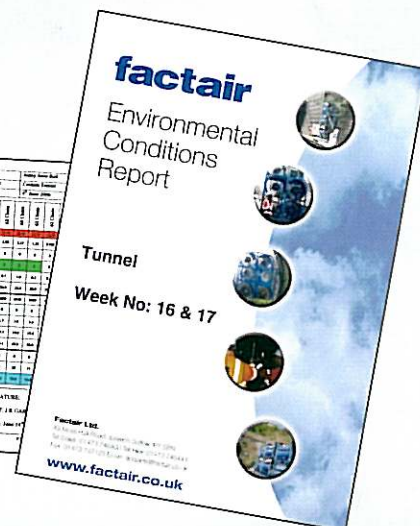
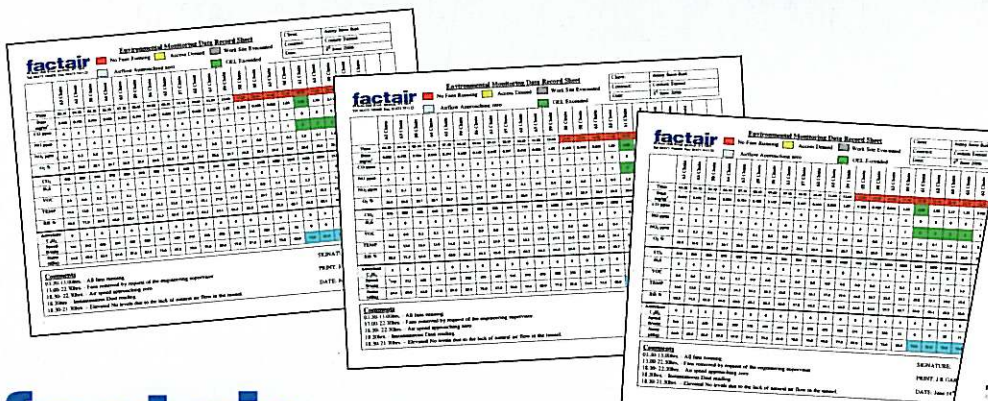
TESTS	8 HOUR TIME WEIGHTED AVERAGE	SHORT TERM EXPOSURE LIMIT	INSTANT ALARM LEVEL
CO	30 ppm	200 ppm	300ppm
CO <sub>2</sub>	5000ppm	8000ppm	15000ppm
NO	5 ppm	5 ppm	5ppm
NO <sub>2</sub>	1 ppm	3 ppm	10ppm
DUST	4 mg/m <sup>3</sup>	10mg/m <sup>3</sup>	10mg/m <sup>3</sup>
O <sub>2</sub>	20-23%	20-23%	
VOC	5ppm	10ppm	10ppm
DUST	Total Inhalable Dust 10mg/m <sup>3</sup> Total Respirable Dust 4mg/m <sup>3</sup>		
<b>Airflow &amp; Temperature:</b> Levels dependent on project requirements			
<b>Humidity:</b> Levels dependent on project requirements			



In addition Factair's engineers can also record noise levels within the workspace, checking that where action levels are reached suitable signage is in place and PPE is provided. These results are then included in the final environmental condition report.

## THE COMPLETE CONFINED SPACE VENTILATION SOLUTION

From the initial site assessment to the final environmental condition report Factair provides a tailored range of ventilation options which are designed to suit the hazards and activities being undertaken. Please contact Factair for further information.



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