

Colt ventilation systems
for car parks, loading bays
and service areas



Maintaining air quality while satisfying safety requirements is a key challenge for car park ventilation



Front cover: Colt Jetstream

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Design support from the experts

Fully controlled manufacturing for reliable quality assurance

Expert project management for stress-free installation

Colt service and maintenance. The UK's best

Colt commissioning. Because anything less is risky



WHY VENTILATE CAR PARKS, LOADING BAYS AND SERVICE AREAS?

Ventilation systems for car parks, loading bays and service areas are needed to achieve two objectives.

Day-to-day ventilation is needed to control build up of vehicle exhaust fumes or spilled fuel when the facility is in general use. Acceptable day-to-day air quality is maintained by removing exhaust gases produced by vehicles, allowing fresh air into the car park from outside and by ensuring that there are no pockets of stagnant air.

Smoke ventilation is needed to provide a means of clearing smoke from the car park during and after a fire. This will limit smoke temperatures and structural damage and inhibit smoke spread between floors.

Smoke ventilation systems may be designed in addition to provide clear smoke-free access for fire fighters to tackle the seat of the fire or to protect means of escape from the car park. These systems are more complex and exceed the requirements of the Building Regulations. They are generally used as compensating features when other requirements of the regulations are not met. Invariably, smoke and fume ventilation are facilitated by the same dual purpose ventilation system.



THE LEGISLATION AND STANDARDS

Throughout the UK there is legislation covering the ventilation requirements in new and refurbished car parks which needs to be satisfied.

The requirements vary slightly from country to country and are detailed below.

Smoke ventilation

- England and Wales: Approved Document B to the Building Regulations (ADB)
- Scotland: Scottish Buildings Standards Technical Handbooks
- Northern Ireland: Technical Booklet E.

Day to day fume ventilation

- England and Wales: Approved Document F – Ventilation (ADF)
- Scotland: Scottish Technical handbook – Non-domestic. 2013 section 3.14
- Northern Ireland: Technical Booklet K – Ventilation. 2012.

Guidance in this document is based upon English Building Regulations.

Additional guidance is given in:

- BS 7346-7: 2013 – Components for Smoke and Heat Control Systems
- Code of practice on functional recommendations and calculation methods for smoke and heat control systems for covered car parks This covers natural ventilation, ducted mechanical ventilation and impulse ventilation, and summarises the requirements of the Building Regulations for both smoke ventilation and ventilation for indoor air quality
- BS 9999:2008 – Code of practice for fire safety in the design, management and use of buildings
- BR 368 – Design Methodologies for Smoke and Heat Exhaust Ventilation (BRE, 1999)
- SCA Guide – Design of Smoke Ventilation Systems for Loading Bays and Coach Parks – a guide for system designers (FETA, 2010)
- SCA Guide – CFD Modelling for Car Park Ventilation Systems – a guide for designers and regulators (FETA, 2007). The guidance makes it easier for designers to validate their designs and for building control bodies to sanction them. See page 8 for further information on CFD
- Upcoming European Standard: 12101-11 – Horizontal ventilation systems for enclosed car parks.

DEFINING CAR PARKS BY THEIR VENTILATION ARRANGEMENTS

The Approved Documents describe three different types of car park and set out the recommendations for each.

1. Open sided car parks

These car parks are generally above ground level, where permanent natural ventilation is available. They should have permanent wall openings on each level, equal to at least 5% of the plan area, arranged to provide cross ventilation. At least half of this should be equally arranged between two opposing walls. These openings are considered to provide sufficient ventilation for clearance of both smoke and vehicle exhaust fumes.

2. Naturally ventilated car parks

These car parks are also generally above ground level but do not have sufficient ventilation openings to class as “open sided”. They should have permanent wall openings on each level equal to at least 2.5% of the plan area, arranged to provide cross ventilation. At least half of this should be equally arranged between two opposing walls. These openings are deemed to provide sufficient ventilation for smoke clearance. However in addition mechanical extract providing three air changes per hour should be provided for day to day usage to remove exhaust fumes.

Note: The 5% and 2.5% areas are defined in Approved Document F as “aggregate equivalent areas”. They do not refer to the geometric areas. An equivalent area has an air flow performance equal to a square edged orifice of the required area.

For openings that are obstructed in any way, by louvres, screens, etc, the aerodynamic coefficient of the obstruction is needed for calculation of the equivalent area.

3. Mechanically ventilated car parks

Where natural ventilation is not possible, such as where the car park is in a basement or fully enclosed, a mechanical extract system should be provided.

The recommendations are that the system should provide 6 air changes per hour (ACH) for day-to-day ventilation simultaneously on all levels and 10 ACH on the fire floor in the event of a fire. The system should be capable of operating at temperatures of up to 300°C for 60 minutes, and ductwork and fixings should be made from materials that have a melting point above 800°C. The system should have at least 2 extract fans, each providing 50% of the duty, with a secondary power supply to operate in the event of a mains power failure. Extract points should be designed with 50% of the extract at high level and 50% at low level.

With mechanically ventilated car parks, Approving Authorities will be looking in particular to ensure that an air change rate to match ADB and ADF has been provided, that there is good distribution (mixing) to avoid stagnant areas, and that requirements for power supplies and 2 or more fans have been met.

Limiting the build up of carbon monoxide

In Approved Document F, the ventilation arrangements described above are “deemed to satisfy” the overriding recommendation that the concentration of carbon monoxide (CO) should not exceed 30 ppm averaged over an eight hour period, and peak concentrations, such as by ramps and exits, should not exceed 90 ppm averaged over a 15 minute period.



THE DESIGN APPROACHES FOR SMOKE VENTILATION OF CAR PARKS

There are two approaches described in BS7346-7.

SMOKE CLEARANCE

Such systems are not intended to assist means of escape in case of fire, but to assist fire fighters by providing smoke clearance. Even a casual inspection of the requirements shows that these methods cannot be expected to do more than limit smoke density and speed smoke clearance once the fire is extinguished.

Ducted systems can be used to distribute extract across the whole of the car park area, with extract points at high or low level or alternatively impulse fans can be used to replace ducting.

Where impulse fans are used, they are located over the roadways in a layout engineered to ensure there are no areas where it would be possible for fumes to build up due to lack of air movement. In most car parks only a single large extract point is required, located as far as possible from the main air inlet openings. This method satisfies the requirements of both Approved Documents and other regional regulations.

Such systems are suitable for use in unsprinklered and sprinkler-protected car parks. However where sprinklers are provided, co-ordination is needed to maximise the benefits of both sprinklers and ventilation and to minimise the air velocity at sprinkler heads close to impulse fans.

SMOKE CONTROL

The alternative approach is to control smoke movement in order to offset omission or reduction of other fire provisions, such as increased compartment volumes in some regions, or extended travel distances, in order to enhance escape or to provide clear access for fire fighters to tackle the source of the fire.

This approach involves a performance-based design to satisfy the requirements of a fire engineering strategy. The design will usually require an appraisal of the risks associated with the strategy and consequently there is no one fixed solution

to each design. Further, the system will most likely require an addressable fire detection system so that the site of the fire can be pinpointed. A control system then starts only the selected impulse and extract fans to control the direction of the smoke and provide clear air in the designated part of the car park.

However, it is generally a more expensive option, requiring more ventilation equipment and more complex controls.

THE DESIGN APPROACHES FOR SMOKE VENTILATION OF LOADING BAYS AND SERVICE AREAS

These areas are not covered by BS 7346-7. However the SCA Guide “Design of Smoke Ventilation Systems for Loading Bays and Coach Parks – a guide for system designers” provides useful information. The main differences occur when smoke control is required due to the much higher fire load from larger commercial vehicles.



THE DESIGN APPROACHES FOR CONTROL OF FUME

When mechanical ventilation is required to assist natural ventilation only for fume clearance, the requirement is either to provide a 3 ACH system; or sometimes, to aid flow distribution in a large car park or one with complex geometry, where an area might be missed by natural cross flow ventilation.

Two options are available: either mechanical smoke extract with impulse fan assistance, or an impulse fan only system, which may need to be reversible with wind direction control.

An impulse fan only system is often the preferred choice as space is always at a premium and extract systems are inevitably bulky. Such a system is designed to achieve 3 ACH under no wind conditions. Wind direction controls are essential to allow the system to be reversible so that the fans assist wind driven air flows. The fans only run at low speed for fume control and are switched off in case of fire, so they can be ambient rated.

PROTECTION OF LOBBIES AND STAIRS

ADB requires stair lobbies to car parks to have 0.4m² permanent natural ventilation (unless the stair is also for firefighting) or be protected from smoke ingress by a mechanical smoke ventilation system. To avoid the need for this natural ventilation, CFD can be used to show that the pressure in the car park outside the door is negative and no smoke enters the lobby when the lobby and stair doors are open.

No extra equipment is usually required but fan location and air flow direction is important.

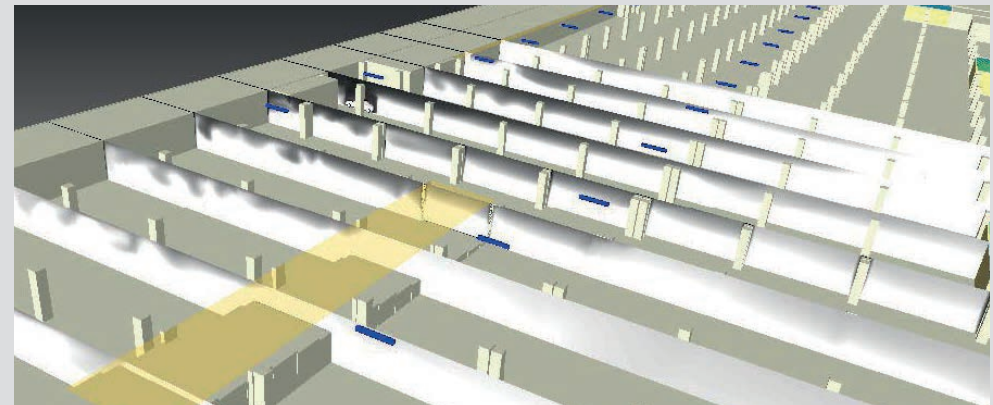
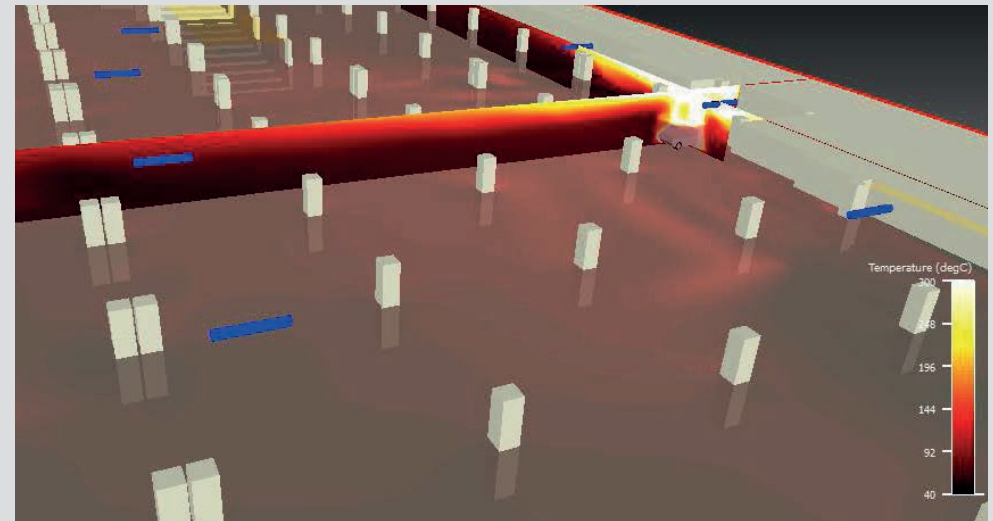
MULTI-STOREY CAR PARKS

In mechanically ventilated multi-storey car parks the design approach is generally to size fans based on 6 ACH for all floors together as this is normally the greatest requirement. In the fire mode fans would be run to give at least 10 ACH on the fire floor only.

Motorised smoke dampers are needed at each level to limit the extract to the fire floor only in fire mode. This discourages smoke movement to other levels.

Automatic drop curtains or fire shutters can be installed to separate floors or to help keep escape routes clear. These are not commonly used and can have the consequence of requiring a separate fresh air supply system if the fire floor is isolated.

Inlet air is normally provided via the entrance/ exit ramp and any other available openings. In multi-storey car parks this area may be insufficient, causing excess inlet air velocities (draughts), or the air flow path to lower levels may lead to air being heavily contaminated before it reaches the lower levels. In either case a separate inlet system to the lower levels would be recommended.



COMPUTATIONAL FLUID DYNAMICS (CFD)

The proving of alternative designs is frequently undertaken by computational fluid dynamics (CFD) analysis, and it may be required by Building Control.

See SCA Guide “CFD Modelling for Car Park Ventilation Systems – a guide for designers and regulators” (FETA, 2007).

CFD can provide detailed prediction of air movement, temperature and smoke density throughout the car park, taking into account the often complex geometry of individual buildings. This level of detail cannot be provided by any other means at the design stage.

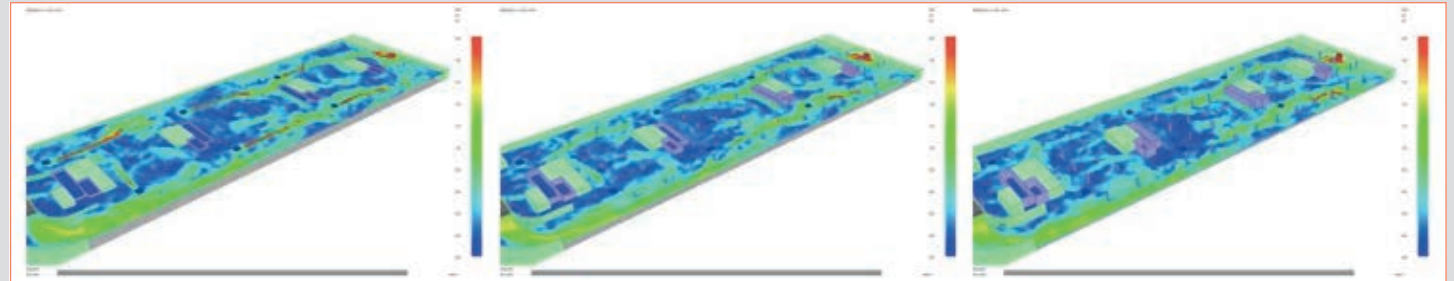
For systems providing fume control and smoke clearance, CFD is commonly used simply to show that the entire car park is properly ventilated with no stagnant areas. While competent designers can often achieve proper ventilation without the need for CFD, CFD is usually requested by Building Control for their approval.

For smoke control systems, CFD is essential to ensure that the system keeps the required parts of the car park reasonably smoke free or to demonstrate that the design objectives have been met.

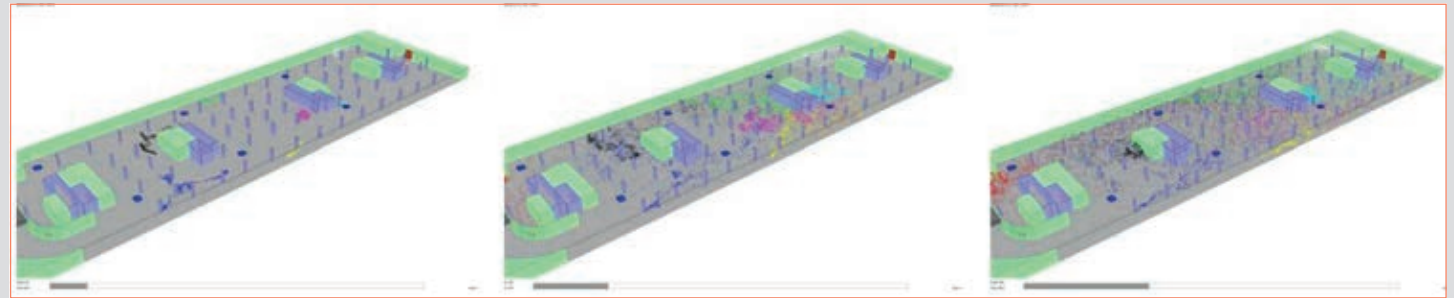
For systems using impulse fans without an extract system to provide fume control only at 3 ACH, CFD is also essential to ensure that the fan layout is sufficient to ensure a flow of at least 3 ACH is achieved without wind assistance.

Colt can provide complete in-house CFD modelling of the system and a full technical report for local authority approval prior to installation.

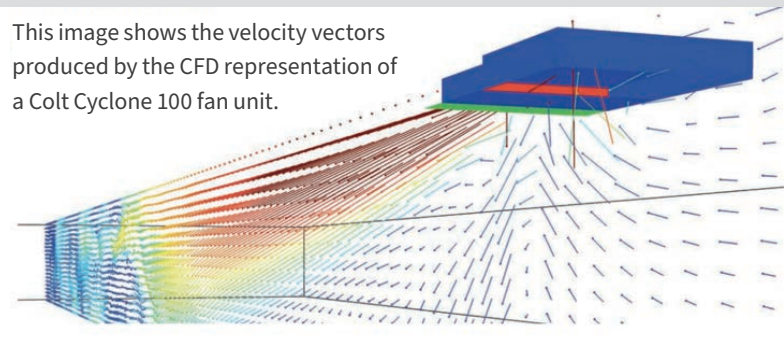
This car park has a ramp providing air inlet on the left hand side, Cyclone fans distributed around the car park and extract plant on the right hand side. Red on the scale represents air speeds of 3m/s and above and dark blue represents 0m/s. These three slices show air velocities at different levels, showing that air moves right across the car park towards the extract point at all levels.



We now show an animation sequence of the same car park. The Cyclone fans are represented by blue squares. The different colour dots show different sources of pollutant, whether this be fume or cool smoke. Again we see that the air mixes evenly across the complete car park.



This image shows the velocity vectors produced by the CFD representation of a Colt Cyclone 100 fan unit.



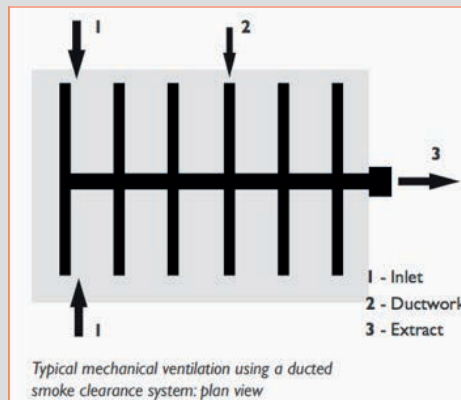
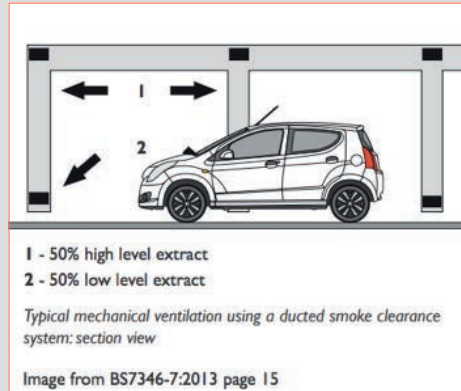
DUCTED MECHANICAL EXTRACT SYSTEMS

Ducted mechanical extract systems are permitted by regulations but are rarely used nowadays due to the benefits provided by impulse systems. They tend to be used only where the car park size and geometry allows good distribution of air to be achieved without needing extensive ductwork.

The main issues relating to ducted mechanical extract systems which often cause problems for designers are:

- the ductwork runs underneath the soffit, reducing the already restricted height normally available.
- downstand beams require the ducting to be set down below them, thus diminishing the height even further.
- low level extract points are required, often needing protective barriers to surround them, and these take up valuable floor space.
- Extensive duct networks can generate significant pressure drops, requiring more power from the extract fans and causing a subliminal increase in the energy consumption of the system.
- the ductwork gives the car park a cluttered look and can interfere with CCTV coverage and lighting.

By contrast, impulse ventilation offers far more effective ventilation.





SMOKE VENTILATION FOR CAR PARKS WITH ELECTRIC CHARGING POINTS

Car parks may experience a new risk with the growing prevalence of electric cars and in particular, the likelihood that the cars will be charged in car parks. This may lead to a number of fires in their lithium ion batteries, that will pose a challenge to firefighters and to those responsible for safety in the car parks.

While pure electric cars (those without an internal combustion engine) are still relatively rare, accounting for only about 1 per cent of all car sales, the market is growing. Sales of pure electric cars in the UK rose by 158% in July 2019 compared to July 2018, with 2,271 new battery electric vehicles (BEVs) registered across the country in July. 70.6% more electric cars were sold up to the end of July 2019 compared to the same point last year.

The time needed to charge an electric car can be anything between 30 minutes and 12 hours, depending on the size of the battery and the speed of the charging point. Pure electric cars, with their larger batteries, will be at the longer end of that time frame.

The result is that there is likely to be increased charging of cars in car parks if they respond to need by installing charging points. The RISC Authority, the research body supported by the insurance industry, has issued guidance on the charging of cars in residential and workplace environments. Although strictly this does not apply to car parks, it is worth noting the guidance. It says: 'the fire safety management strategy should consider practical passive, active and managerial control measures as part of the fire risk assessment for the premises

when selecting and designing areas for charging electric vehicles and mobility scooters.

Because charging of electric vehicles will often continue when premises are unoccupied, the measures to be considered should include:

- physical segregation of the charging points from process and storage areas
- provision of suitable power supply, control and isolation systems;
- suitable fire detection and warning installations in case of fire;
- provision of suitable portable firefighting equipment;
- development of an emergency action plan to protect life and property and ensure the continuing functioning of the business in the case of fire; and
- staff training in the safe charging of vehicles and the actions to take in the event of fire, including the safe shut down of the charging process and evacuation of the premises.



IMPULSE VENTILATION SYSTEMS

Noise is often a critical issue.

Impulse ventilation systems push the air through the car park towards a single extract point, rather than pulling it to multiple extract points as a ducted mechanical extract system would. They provide greater flexibility and effectiveness.

Impulse ventilation systems comprise a series of fans located under the ceiling which generate thrust (like a jet engine) and add momentum to the air.

Using a small fan at high velocity results in a large air movement at low velocity as the jet of air spreads out. A general air flow is created towards pre-designated extract points, moving smoke and fumes with it.

The number and location of fans are carefully chosen to match the system design requirements and to ensure that there are no dead spots for fumes and smoke to stagnate and collect.

THE COLT JETSTREAM IMPULSE UNIT

General description

The Jetstream impulse unit comprises an axial fan with inlet and discharge attenuators.

Versions

Versions are available to match most customer requirements.

- Two fan sizes, 315mm and 400mm diameter, with overall depths of 335mm and 365mm respectively
- Thrusts of up to 50N
- Uni-directional or truly reversible for additional design flexibility
- Two speed, or single speed with potential for inverter control
- Ambient or high temperature smoke operation Jetstream is 3-phase.

FEATURES AND BENEFITS

Proven performance

Independently tested and certified in accordance with EN 12101-3: 2002, achieving a F300 rating – continuous operation for one hour at 300°C.

Durable

Hot dipped galvanized finish resistant to potential corrosion.

Performance

Adjustable pitch aerofoil section impellers, set and tested in the factory, to provide optimum aerodynamic performance.

Easy maintenance

A minimum protection to IP55 on fan electrics enables fan maintenance and cleaning by pressure washing. External padlockable isolator switch protected to IP65.

Slimline appearance

Standard version uses spigot fixing of attenuators and streamlined attenuator lining to maintain a slim, clean profile.

Truly reversible

For additional design flexibility, as part of a comprehensive scheme, the control system can direct the airflow in either direction.

Quality of manufacture

Jetstream is manufactured under the BS EN 9001 quality standard. Each unit is given a functional test before despatch.

Variety of finishes

Jetstream's casing is hot dipped galvanised, whilst its attenuators are pre-galvanised sheet. It has the option of any polyester powder coating to a RAL colour.

Low noise output

CIBSE Guide Volume A:1999, Environmental Design, sets out a recommended maximum noise level of NR55 in car parks. Jetstream fans will achieve these required noise levels.



[DOWNLOAD PRODUCT DATA SHEET](#)

INDUCTION VENTILATION SYSTEMS

Induction ventilation systems further enhance the impulse ventilation concept.

Using the same principles as impulse ventilators, induction fans are shallower and potentially more powerful, thus reducing the number of units required. Impulse fans are generally limited to a thrust of around 50N as they otherwise become physically too large for the constricted space available in a car park. Induction fans have thrusts up to around 100N. The floor area ventilated per fan is thus significantly greater, equating to a requirement for fewer units. However, in contrast to impulse fans, induction fans cannot generally be made reversible.

Induction fans are shorter and shallower than impulse fans, so have less impact on the usable height within the car park. They are particularly suited for effective ventilation where downstand beams are close together as they can more easily be located between them without compromising their performance.

Fewer units mean lower cabling and controls requirements and lower installation and maintenance costs.

THE COLT CYCLONE CAR PARK INDUCTION FAN

General description

Colt Cyclone is a low profile, high velocity induction fan intended to control air movement in car parks and underground service areas. Cyclone reduces levels of polluted air during day to day use and assists with the extraction of smoke in the event of a fire, directing polluted air and smoke towards the extract positions in a car park or underground service area. It is tested and certified to EN 12101-3.

Cyclone uses tunnel ventilation technology to eliminate the need for costly and bulky ductwork. Compared to ductwork systems, this may save car parking spaces, reduce running costs and noise, and make the car park a lighter, less cluttered environment.

FEATURES AND BENEFITS

Slimline design

Only 308mm or 252mm overall depth. This reduces the required headroom in car parks and thus lowers excavation costs.

Certified performance

Cyclone has been exhaustively tested and certified to EN 12101-3 in accredited third-party test laboratories and is CE marked. Cyclone 100, Cyclone 50 and their standard isolators fully meet the F300 time/ temperature classifications of EN 12101-3 (300°C continuous operation for one hour). Cyclone achieved 2 hours under test.

Durable construction

Cyclone is manufactured from pre-galvanised sheet with the option of a polyester powder coating to any RAL colour.

Low maintenance

With the additional advantage that there is no ductwork to clean.

High thrust

With a higher thrust, each fan can ventilate a significantly higher floor area. This means that fewer units are required than with conventional impulse units. Fewer units mean lower cabling and control requirements as well as lower installation and maintenance costs.

Speed options

Suitable for either two speed or variable speed operation, depending on the application. Where the unit is inverter (variably) controlled, the amount of power consumed is reduced. Cyclone is 3-phase.

Low noise output

CIBSE Guide Volume A: 1999, Environmental Design, sets out a recommended maximum noise level of NR55 in car parks. When operated on inverter control, Cyclone meets this noise level.



Colt Cyclone is a low profile, high velocity induction jet fan intended to control air movement and direct polluted air and smoke towards the extract positions in a car park or underground service area.

[DOWNLOAD PRODUCT DATA SHEET](#)

NOISE CONTROL

Noise is often a critical issue.

CIBSE Guide Volume A: 1999, Environmental Design, sets out a recommended maximum noise level of NR55 in car parks when the equipment is running in day-to-day mode. We would recommend NR55 is specified, but car park ventilation systems can be designed to achieve lower noise levels if required, although this requires fans being inverter controlled to run at lower speeds, often meaning more fans are needed and increasing costs.

External noise should always be considered, especially in urban areas. There is usually a planning condition restricting noise output from building plant. Colt can design car park ventilation systems to achieve the required noise levels.

EXTRACT SYSTEMS AND ANCILLARIES

There needs to be an adequately designed extract system to extract the air. In addition, where the natural air supply is insufficient, a supply system may also be required.

Depending on the scope required, Colt can design and provide a wide variety of mechanical extract fan and motor assemblies to suit the required duty and temperature rating. These include long case, short case and plate mounted axial fans.

Where required for smoke extraction, Colt extract fans have been tested to the exacting standards of EN 12101-3: 2002.

We can provide complete supply and extract systems tailored to meet the project requirements.

Ductwork

Including attenuators, grilles, volume control dampers, shut-off dampers, bends and transitions.

Weathered external terminations

Including louvres, dampers, turrets, gravity shutters, cowls and motorised ventilators such as the Seefire, Coltlite and Firelight.



CONTROLS AND SENSORS

The design of the controls including their associated sensors is an integral part of any car park ventilation system.

Day-to-day condition

The simplest (but rarely used) option is to run the system at a constant speed, providing a ventilation rate of 6 ACH throughout the car park. The most common option, chosen to significantly reduce energy usage, is to add a CO detection system to allow the system to run at a reduced ventilation rate in periods when vehicle movements are low.

Fire condition

For a smoke clearance system, single zone fire detection is all that is required for each level of the car park. Upon detection all impulse fans on that level operate at high speed, all other fans are switched off and the extract fans are switched to full speed, extracting only from the fire level, usually achieved by the use of dampers on each level.

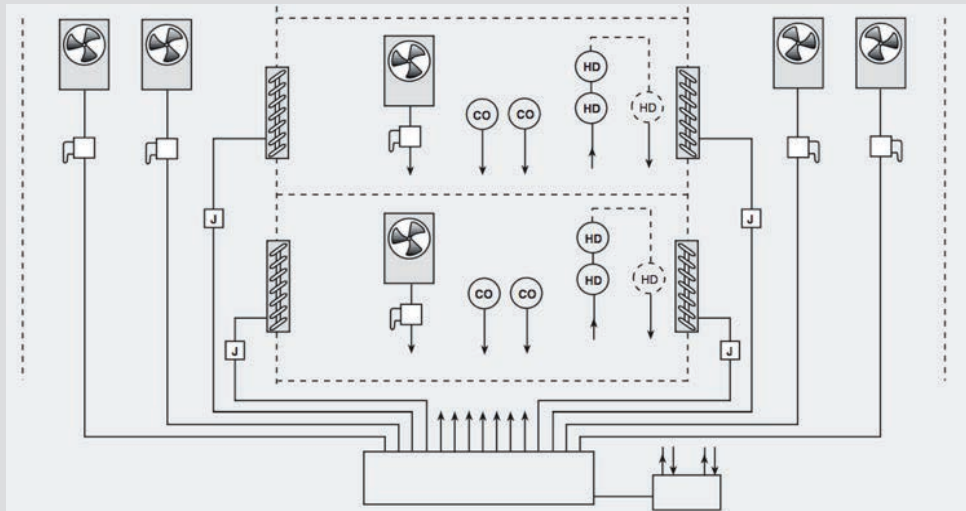
For a smoke control system, addressable detection is required to pinpoint the fire location to allow correct selection of fan operation to maintain the required clear areas.

Colt can provide a full system comprising control panels, carbon monoxide (CO) detection, and an addressable heat/smoke detection system. Alternatively our control panels can be linked to the building's fire alarm system.

Typical single storey car park control sequence

For day-to-day ventilation, based on highest individual CO sensor reading:

- low CO (less than 15ppm): half extract fans at low speed
- normal CO (less than 30ppm): impulse fans at slow speed, half of the extract fans at slow speed
- high CO (above 30ppm): impulse fans at slow speed, all extract fans at slow speed.



- high CO (above 30ppm): impulse fans at slow speed, all extract fans at slow speed.

For fire, initiated by detection or sprinkler flow switch or fire fighters override switch:

- impulse fans full speed, extract fans full speed
- for smoke clearance run all impulse fans, for smoke control only run the selected impulse fans for the fire zone.
- a short delay may be built in before starting the impulse fans to allow evacuation before disturbing the smoke layer.

WHY CHOOSE COLT

Every type of building presents different dynamics and requirements, and when you work with Colt, you can count on full peace of mind in every phase of the project and for the full life cycle of your system because our experts understand the engineering and architectural challenges of different buildings.

We are able to provide all the equipment necessary for smoke control of multi-storey buildings: OV's, AOV's, shaft systems, access hatches, smoke dampers, smoke door and window actuators, smoke detectors, break glass switches, and manual and automatic controls. Colt gives you more expertise and experience, across every aspect of your project, than anyone else in the industry. And it's all in-house.

No one else provides you with a genuine one stop shop, offering a full turnkey service from concept to completion. Where others subcontract out much of the work, Colt takes complete control of the whole process, from design, manufacture, installation, through to commissioning and ongoing maintenance.

IT STARTS WITH THE COMMERCIAL TEAM AND THE CONSTRUCTION TRIANGLE

The Colt approach combines the three key disciplines of Design and Technical, Commercial and Operations. This tripartite approach is mirrored from when we first start talking about your project, right through the whole process, all the way down to operational project level.

Our Commercial team is highly experienced: its 26 people are mainly technical consultants and surveyors, led by our Commercial Director who has 35 years with Colt. Our Regional

Managers each have over 20 years' experience; some of our Technical Consultants have longer still. And we make sure they also have the expertise: they are fully trained in processes and procedures; our Technical and Engineering Directors run regular training sessions (typically every six weeks) for all consultants to ensure that their knowledge of products, systems and the regulatory landscape is always up to date.

A regional approach. Our regional presence makes it possible for us to carry out site surveys prior to the contact period if required. More importantly, it means our technical consultants and regional managers are on hand locally to pull the entire project together. And they have the expertise and experience to know what they're doing.

DESIGN SUPPORT FROM THE EXPERTS

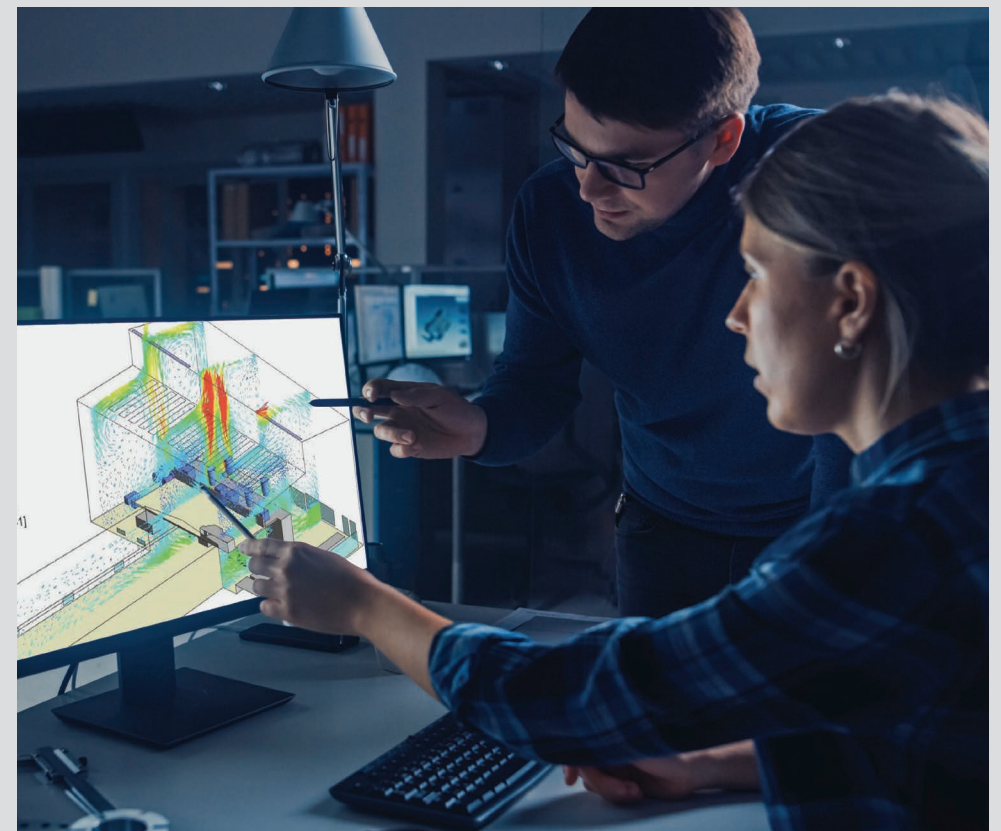
Our vastly experienced Design and Technical team, comprising some 25 people, enables us to provide CFD, CAD and BIM in-house. Only Colt can do this for you. Both our Technical Directors have over 30 years' experience with us; all our Technical Designers are graduates, several at M. Eng. level. Unusually, the team also includes electrical controls specialists and software programmers.

Thanks to our highly trained and experienced staff, we can develop tailor made smoke control systems that will meet both your

building's needs, as well as the legalities connected with your project.

At Colt, we scale across multiple markets, which means we have the staff and expertise to develop tailor made systems integrating climate control, natural ventilation, solar shading and smoke ventilation. Our systems can help you unlock your building's potential

for energy efficiency, ensure fire safety and create architectural impact. Our experts have an in-depth knowledge of technologies and techniques across a wide spectrum. We have the experience to advise architects and consultants on the best combination of products and systems to achieve the desired effect and performance.





To assist with designing effective building conditions, we use in-house *computational fluid dynamics* (CFD) and other design tools to simulate airflows and heat transfer within buildings. This knowledge enables us to design tailor-made concepts fully suited to every specific situation.

On solar shading projects, Colt experts can provide calculations of sun angles and heat loads to ensure the building's best performance.

FULLY CONTROLLED MANUFACTURING FOR RELIABLE QUALITY ASSURANCE

With our modern manufacturing hub in Havant, you can rest assured about the quality of Colt products. We manufacture from raw materials right through to finished goods. This means that we control the whole process from start to finish, so we can ensure the quality, performance and reliability of all the products we manufacture. All our products have the highest available level of certification.

Real-life testing to ensure you get the best solution. We combine extensive testing with our manufacturing processes to ensure that the systems we provide are the most effective solution for your building. Our R&D Centre uses the latest technologies to carry out evaluations and simulations, with comprehensive testing to verify the performance of our products and systems. We use independent accredited test houses to carry out fire testing, environmental testing (for wind, rain, snow) and safety testing (for load and impact).

EXPERT PROJECT MANAGEMENT FOR A STRESS-FREE INSTALLATION

Colt's smoke control team is one of the best in the world. All our project managers, site managers and commissioning engineers have the qualifications, technical knowledge, resources and experience to provide you with a stress-free experience, from installation through to commissioning. As a vertically integrated company involved in not only the

management and installation of projects, but also the design and production of systems and products, our lead times are more reliable, because we manage the supply chain from manufacture through to installation and service. We deliver the entire project without needing to joint venture with other companies, saving you time, money and resource. Systems and products can be tested in our own project-testing laboratory in order to identify problems before they arise.

As well as exceptional training, all the necessary qualifications and the latest management technology to deal with the installation and project management, the Colt team has something that other teams don't – the benefit of over 70 years of experience. We can predict problems before they happen and we have the skills to guide your project around obstacles before they become a problem, all the while keeping you informed at each stage of the process. This is one reason why we have the widest range of successfully completed smoke projects in our fields.

We work closely with the client's project team, using industry leading software that many of our customers use.

Our operations division has over 40 people, including 16 project managers, six site managers, eight commissioning specialists and five more in QHSE. All have the relevant H&S qualifications that identifies that they are SMSS or SMTS. Many of our staff have taken CIOB (Chartered Institute of Building) and APM (Association of Project Managers) qualifications to be able to deliver world class project management.

We have strong and long-established relationships with carefully chosen installation sub-contractors who are well versed in our values and understand the importance of the five key objectives.

Our success is based on our ability to excel in the Colt five-part plan for successful project delivery.

- 1 **Safety.** We will never compromise on safety. Read about our H&S awards and accreditations.
- 2 **Quality.** We ensure that we provide the highest possible standard of service throughout the delivery phase. Download our quality assurance certificate.
- 3 **On time.** We use the latest planning and programming tools to help us plan, agree and, through regular review and adaptation of our plans, meet all deliverables including our clients' key milestone dates.
- 4 **To the contract.** We will ensure that we fully understand the contractual requirements at the earliest possible stage. Whilst avoiding "scope creep", we will ensure that all deliverable requirements will be met.
- 5 **Within budget.** At the pre-order stage we can assist with accurate cost estimation. Having secured the above four key objectives, we will also be able to deliver the project according to the client's budget.



COLT COMMISSIONING. BECAUSE ANYTHING LESS IS RISKY

It is crucial to carry out correct commissioning with ample time allowed for it. Yet there are many companies who would have you believe that commissioning involves turning the system on and off again, then handing it over to the building managers. Typically, other companies do not employ commissioning staff directly, but sub them in only when needed. Commissioning is an absolutely critical part of the process for life safety systems; we uniquely have the resources and expertise to do this properly.

Only Colt has an in-house team of eight commissioning engineers and managers. All our commissioning engineers are SSTS accredited. Properly done, the Colt way, the commissioning process often takes over a week, just at that end stage. Our Commissioning staff also are involved earlier in the process, to ensure that all the prerequisite

stages have been properly completed. Colt complies fully with BS7346-8, the one piece of smoke control legislation that is specific to the commissioning process. The first stage, Commissioning and Verification, involves thorough Static Testing, Functionality and Cause & Effect and Performance testing. The final stage is the System Acceptance, which covers Witness Testing, Demonstration and Sign-off and Client Training. This last item provides a handover pack, testing instructions, staff occupant training and a log book.

THE DRAFT BUILDING SAFETY BILL IS ALL ABOUT COMPETENCY. SO IS COLT

Since 1931, Colt has been leading the way in smoke control technology and regulation and we're still doing it now.

With two chartered engineers on eight regulatory committees, including British Standards and European Construction Product Regulations.

We are true thought leaders and are actively involved in updating legislation. Who else would you trust to negotiate the labyrinth that is the regulations and guidance documentation?

Competency is crucial. Colt is the first UK smoke control business to be certified to both IFCC SDI 19 and SDI 05 standards, developed by the SCA. These certifications, which have been provided by IFC, have been awarded in recognition of Colt's skill as an installer and servicer of both smoke control systems and fire curtains.

SDI 19, which is mandatory for all smoke control installations, aims to ensure that installers are competent in areas such as fire strategy, scheme design and installation. SDI 05 demands the same levels of competency in regards to the installation, commissioning and servicing of active and fixed barriers for fire and smoke control. Colt accreditation and certification overleaf.



This certification scheme will ensure quality and competency, affording the end user confidence that their safety critical system is fit for purpose. Certified contractors will have clearly demonstrated that their trained staff consistently adhere to industry best practice and fully appreciate the importance of correct installation, inspection and maintenance.

SCA Chairman

COLT SERVICE AND MAINTENANCE ENGINEERS. THE BEST IN UK SMOKE CONTROL

Colt support doesn't stop when your system is installed: we remain at your side to service a wide variety of building services equipment, whether we supplied it or not, to ensure that it continues working at its greatest efficiency throughout its life cycle.

70 years of experience in servicing smoke control systems. Colt service engineers are trained up to the highest available standards. When one visits your site, you can rest assured that your buildings' systems are in competent, professional, trustworthy hands. Each one of our 60 engineers has been expertly trained with one aim in mind – to keep your buildings safe and legal. Our team is so dedicated to delivering good quality service that our longest serving engineers have an average of 20 years each at Colt. That's truly unparalleled experience.

For Colt engineers, the training never stops. Each one of our engineers undergoes comprehensive, initial training from our technical department upon joining. This is topped up regularly with knowledge and skills in the latest technology and regulations. Our engineers also know that a simple smoke or functionality test is not a service. Many of the engineers we hire from other firms are often staggered at the sheer thoroughness of a Colt site visit.



IFC SDI 19 & SDI 05
SDI 05 "Requirements for Contractors Installing, Commissioning and Servicing Active and Fixed Barriers for Fire and Smoke Control". SDI 19 "Requirements for Contractors Installing Smoke Control Systems".



Smoke Control Association
Smoke Control Association (SCA) members lead the way in promoting and enhancing the design, manufacture, installation and maintenance of life safety smoke ventilation systems.



Association for Specialist Fire Protection
Colt is a member of the ASFP, who are dedicated to the protection of life, property and the environment, seeking continuous improvement in all aspects



Quality Management System
Colt operates a Quality Management System for the design and manufacture of its products which complies with the requirements of



Environmental Qualifications
Colt operates an Environmental Management System which manages the environmental impacts associated with its business.



Management System Certification
ISO 45001:2018 specifies requirements for an occupational health and safety (OH&S) management system.



CHAS Assessment Scheme
Colt holds accreditation which is within the Contractors Health and Safety (CHAS) Assessment Scheme.



Worksafe Contractor
Colt's health and safety documentation has been checked and approved by Safety Management Advisory



Altius Assured Vendor Award
Colt is an Altius Assured Vendor.



Constructionline
Colt is a member of Constructionline which demonstrates that its Health and Safety systems are robust.



CIBSE Patrons
Colt is a CIBSE Patron and all our CPDs seminars are fully accredited by them.



Avetta Safety Schemes in Procurement
Colt is compliant with Health & Safety and CDM regulations.



RoSPA Order of Distinction Award
Colt has been awarded the RoSPA Order of Distinction for Occupational Health and Safety performance in 2018.



Health in Construction Leadership Group
The HiCLG aims to unify the construction industry in its approach to worker health protection and promotes the best practice processes and initiatives.

Nationwide service coverage and fast response times. Colt is the UK's only smoke control maintenance provider big enough to offer truly nationwide coverage and regional contracts. Because of this, our engineers can be found stationed everywhere up and down the country and have an average response time of 4 hours and a guaranteed response time of 24 hours. You can count on them 24 hours a day, 365 days a year, no matter where you are.

UNRIVALLED EXPERIENCE AND EXPERTISE

As enclosed car parks have grown so has our experience and expertise in smoke control. We have unrivalled experience. In 1954, we designed the UK's first-ever smoke control system to be installed in a manufacturing plant. And, ever since, year in, year out, we've been busy installing our systems into all sorts of buildings, big and small, throughout the UK and abroad.

Our top 10 current/recent projects

- St. James Quarter, Edinburgh
- Middlesex Street, London
- 10 George Street, Edinburgh
- Tavistock Gardens, West Drayton
- Green Quarter, Manchester
- The Post Building, London
- Wandsworth Riverside, London
- Olympic Park, Belfast
- Barclays Campus, Glasgow
- MODA Springside, Edinburgh

SIZE IS NOT IMPORTANT TO US

Given our involvement in so many taller and more complex projects, you could be forgiven for thinking that we are not interested in taking on smaller and more straightforward projects. You couldn't be more wrong. We're equally at home at the smaller end of things. In fact, we handle everything from straightforward stairwell and underground car park smoke clearance systems right through to complex mechanical and environmental life-saving systems.

We treat these smaller projects with the same care and attention to detail with which we treat large ones. And, because we're big, with broad shoulders, we don't run out of steam; we'll stay with you all the way to the completion of your project.

As ever, our aim is to make the use of our smoke control systems as hassle-free as possible.



If you need help with a multi-storey project, talk to us today.

Email us: project.admin@uk.coltgroup.com

Call us: 02392451111

Visit our site: <https://www.coltinfo.co.uk/smoke-control.html>

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“Expertise built on experience.”

