

The Company, its products and services





#### Colt International in the spotlight

#### THINK GLOBAL - ACT LOCAL

Colt International is a Colt Group Company, one of Europe's leading, independent providers of building services with an annual turnover in excess of £100 m and approximately 850 employees.

The Colt story is an unusual one. From small beginnings in 1931, when Jack O'Hea founded the Company, the story is one of pioneering spirit and ingenuity that has led to the family business growing to being represented in more than 50 countries, and offering its customers the best in products and systems to make the environment associated with buildings healthy, safe, productive and comfortable.

Colt offers an in-depth knowledge of a wide spectrum of technologies relating to fire protection, air movement, solar control and daylight control for both new and refurbished buildings, that has been developed over these 75 years. This knowledge has been built up from hundreds of tests and from thousands of installations.

Where appropriate Colt aims to provide the customer with solutions that reflect this wide knowledge base. Being able to see the whole picture, Colt can best help the customer specify systems that reduce environmental impacts and whole life running costs, and at the same time which can provide aesthetic impact.

Colt's innovative attitude and capability is backed up by its own Manufacturing and R&D facilities, which enable it to develop unique or improved solutions. The Group's continued growth and success reflects the excellent relationships it fosters with its customers, whether they be Architects, Consulting Engineers, Contractors, Facilities Managers or Building Occupiers.

Colt's services may include problem solving and advice, project management, and the design, supply, installation, commissioning and maintenance of systems.

Quality and safety underpin all our activities. We operate to strict quality and environmental standards including ISO 9001 and ISO 14001, and many of our products have a beneficial impact on the environment by helping to save energy.

Colt strives to offer the highest levels of customer service and technical support from initial enquiry through to project completion and beyond.

#### **COLT'S PRODUCTS AND SERVICES**

Colt's business is to design, manufacture, install, commission and service the following systems:

- HVAC (Heating, Ventilation and Air Conditioning) Systems
- Smoke Ventilation Systems
- Natural Ventilation Systems
- Glazing Systems
- Screening and Performance Louvre
- External Solar Shading systems -Brise Soleil, Louvres and Fins

"Colt's one-stop service combined with a customer-focussed approach means that the customer can rely upon Colt to stand by his side, from the design phase right through to handover."





## We create good internal conditions

### EFFECTIVE CLIMATE CONTROL REQUIRES EXPERIENCE

Meteorologists define climate as the average condition of the atmosphere above a defined region. Temperature, humidity, air movement and solar intensity define the climate. These parameters also define the internal climate of a building, but with one key difference: the climatic conditions are determined artificially, and all the elements - temperature, humidity, air movement and solar intensity - need to be in equilibrium as the prerequisite for optimum comfort and productivity.

No building is like any other. Its internal climate will vary in accordance not only with the season, but also with its location, how it has been constructed, and the use to which it is put. Thus each building requires a custom design or solution to a problem in order for that design or solution to be effective and efficient.

Colt can draw on its experience over many years of providing all manner of climate control designs and solutions in such diverse buildings as apartments, factories, offices, leisure centres, schools, warehouses, retail parks, car parks and shopping centres. Colt is also active in a wide variety of industries, such as food, plastics, engineering, automobile, plastics, chemicals, metals, paper and glass.

Colt has at its disposal an extensive range of climate control products and systems. Its latest development is Caloris, which you can read about on the following pages.

### FEATURES AND BENEFITS OF COLT CLIMATE CONTROL SYSTEMS

Colt Climate Control Systems can provide:

- Less absenteeism
- Comfortable internal temperatures
- A general feeling of well-being
- More productive working conditions
- Higher profitability

"Colt has at its disposal an extensive range of climate control products and systems."



## Colt has developed Caloris WRF®, a wholly new concept in air conditioning

#### INDIVIDUAL AIR CONDITIONING BASED ON HEAT PUMP TECHNOLOGY

Colt has developed WRF (Water and Refrigerant Flow) - a revolutionary air conditioning system designed to meet the environmental requirements of both current and future building regulations, including F-Gas. WRF is a viable alternative to VRF and VRV air conditioning, combining their advantages with a safe and flexible, water-based system.

Caloris is a typical example of a WRF application. Caloris consists of a series of reverse cycle water source heat pumps and, generally, a central external heat pump that are all connected together by a neutral water loop. Caloris is suitable for both heating and cooling, offering individual or zone control.

It provides all the benefits of simultaneous heating, cooling and energy recovery found in VRF heat recovery systems, without needing to move vast quantities of refrigerant around the building.

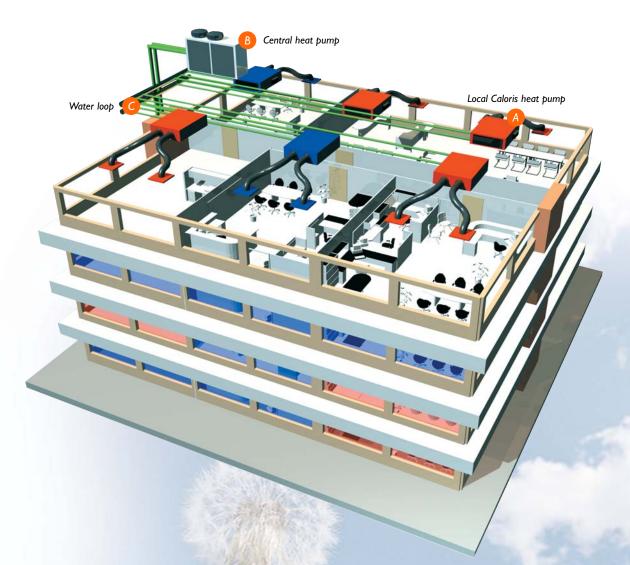
All the local units and external mounted heat pumps are connected by a main two pipe, water loop system. Since the temperature of the water is neutral, neither insulated piping nor copper piping is needed. Plastic polyethylene piping offers many cost and reliability benefits. The pipes can be quickly installed into the system without any risk of condensation.

The local heat pump has been engineered with many innovative features in mind that enable it to be compact, efficient and low in noise output, making it particularly suitable for hotels and offices.

Caloris is also highly efficient, with its indoor units achieving a COP of between 4 and 6 depending on the application. The fact that the water temperature of the water loop is maintained close to normal indoor room temperatures means that the heat pump equipment will always operate at maximum efficiency. More importantly, the uninsulated pipework can use the building's thermal mass to smooth out peaks and troughs of load and store energy, and hence utilise "free" heating and cooling from the building fabric itself. Caloris is also suitable for ground sourcing.

The local horizontal heat pump unit (sizes 1 to 4) measures just 247mm deep. The size 7 heat pump unit measures 339mm deep. It is amongst the slimmest on the market and is designed to easily fit within most ceiling voids. The local vertical heat pump is less than 500mm high and is thus suited to fitting under windows.

## "Caloris has set new standards in air conditioning."



#### Local Caloris heat pump

Each internal space or room contains its own local unit, which either takes energy from or gives energy to the water loop, thereby either heating or cooling.

#### External central heat pump

This unit intervenes to stabilise the temperatures in the water loop only when the possibilities to do so via the fabric of the building have been exhausted.

#### Water loop

All the local units are connected by a two pipe water loop pipework system. The pipework is plastic and this enables quick installation without specialist skills. Because it is uninsulated, energy can be stored in the building's thermal mass.





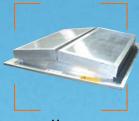








# Colt's heating, ventilation and air conditioning product range Benefits of a wide portfolio



Meteor -Natural Ventilator



Tornado - Mechanical Extract Ventilator



Convair -Suspended Heater



The wider the spread of technologies on offer, the greater the potential there is for significant improvement of the internal environment.

For example, natural and mechanical ventilation systems are often dual purpose, allowing smoke control as well as day to day ventilation.

Alternatively, natural ventilators can be fitted with translucent or transparent lids or louvres to allow the entry of daylight. In many cases Colt heating systems allow for the possibility of heat reclaim.



"The modular and multi-functional character of Colt climate control systems allows them to be a valuable investment."



## We provide peace of mind

### NO COMPROMISE WITH REGARDS TO SAFETY AND SECURITY

Safety and security is high in the hierarchy of needs. Thus mankind will devise whatever means possible to maintain a high state of safety and security. This is particularly obvious in the case of fire prevention. There is a wide spectrum of available measures, both active and passive, to reduce the effects of fire.

Despite these, fires continue to cause many deaths. The greatest threat is not the fire itself but the smoke. Depending on the nature of the fire, it is possible to fill an area of 10,000 m² completely with smoke within minutes. Five breaths is all it takes for consciousness to be lost.

Colt has always been a solutions-led company and has positioned itself at the forefront of development. Colt has and continues to be intensely involved in finding solutions to smoke control problems.

Colt supplied the world's very first installation of smoke ventilation in 1954 at General Motors, Luton, UK. Colt has pioneered the science of smoke control, and has funded much of the public research over a period of more than 50 years. Many National and European Regulations are based on that research.

All Colt's smoke control products have been tested to and comply with the latest Smoke Control Standards.

### FEATURES AND BENEFITS OF COLT SMOKE CONTROL SYSTEMS

These systems:

- Exhaust smoke and heat
- Contain smoke
- Attain a smoke free zone
- Enable the immediate evacuation of a building
- Allow the source of the fire to be pin-pointed
- Help avoid flashover
- Allow immediate fire-fighting
- Contribute to a reduction in damage to property

The smoke control of car parks requires a special design approach. Please turn to the next page for more details of Colt's latest developments for car parks.

"The latent hazard of smoke should not be underestimated.

Five breaths is all it takes for consciousness to be lost."



## Jetstream & Cyclone: smoke control for car parks

#### THE DESIGN APPROACH FOR CAR PARKS

For many years, car parks and tunnels have been ventilated by conventional HVAC ducted and extract systems.

A relatively new concept is impulse ventilation. Impulse ventilation systems can be used to control the flow of smoke within a car park, keeping large areas effectively smoke free. This allows the fire service to see and come close to the fire in clear visibility, allowing effective fire fighting.

The techniques used are to add momentum to the air, to thrust it towards extract points and to ensure that there are no dead spots for fumes or smoke to stagnate and collect. These systems can also be used to reduce carbon monoxide levels in car parks.

A series of small fans, mounted under the ceiling, direct airflow from the air inlet openings towards the exhaust fans, effectively clearing smoke and fumes in the process. The number and location of fans are carefully chosen to match the design requirements.

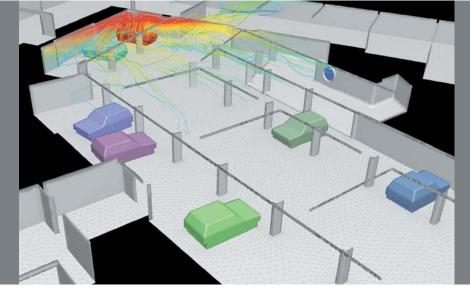
The major practical benefit of the system is that it removes the need for distribution ductwork in the car park. This provides more space for parking bays. The environment is safer and leads to better security from CCTV systems. Also, the installation of the equipment is much easier and significantly faster.

Colt has taken the impulse approach one step further, and now offers both a Jetstream impulse unit and a new Cyclone induction unit. The new Cyclone induction unit is available in two versions. It consists of a low profile, high airflow fan, which creates even greater momentum and more effective air movement, thus significantly reducing the number of fans required.

Backed by extensive CFD analysis, Colt can offer the complete car park ventilation package including extract and induction fans, smoke and carbon monoxide detectors, control, extract ductwork and wiring.

Colt has carried out hot smoke tests to verify the predictions made by the CFD programs that it runs. These predictions are capable of providing a realistic visualisation of the spread of smoke from a car fire.

Colt can provide all system components within a complete package of extract systems, ductwork, grilles, dampers and external terminations, including all necessary controls and detection.



Besides carrying out actual smoke tests, Colt uses advanced CFD techniques to simulate the likely flows of heat and gas in a fire situation.

"Colt car park ventilation systems serve the dual purpose of controlling smoke and reducing carbon monoxide levels."



#### Jetstream

This unit adds momentum to the air to thrust it towards an extract point, thereby keeping large areas effectively smoke free.



#### Cyclone

This is the next generation of impulse fan, allowing yet larger volumes of air to be moved, and suitable for installation in car parks with low headroom.





#### Mechanical extract systems

These are designed to exhaust smoke and exhaust gases.





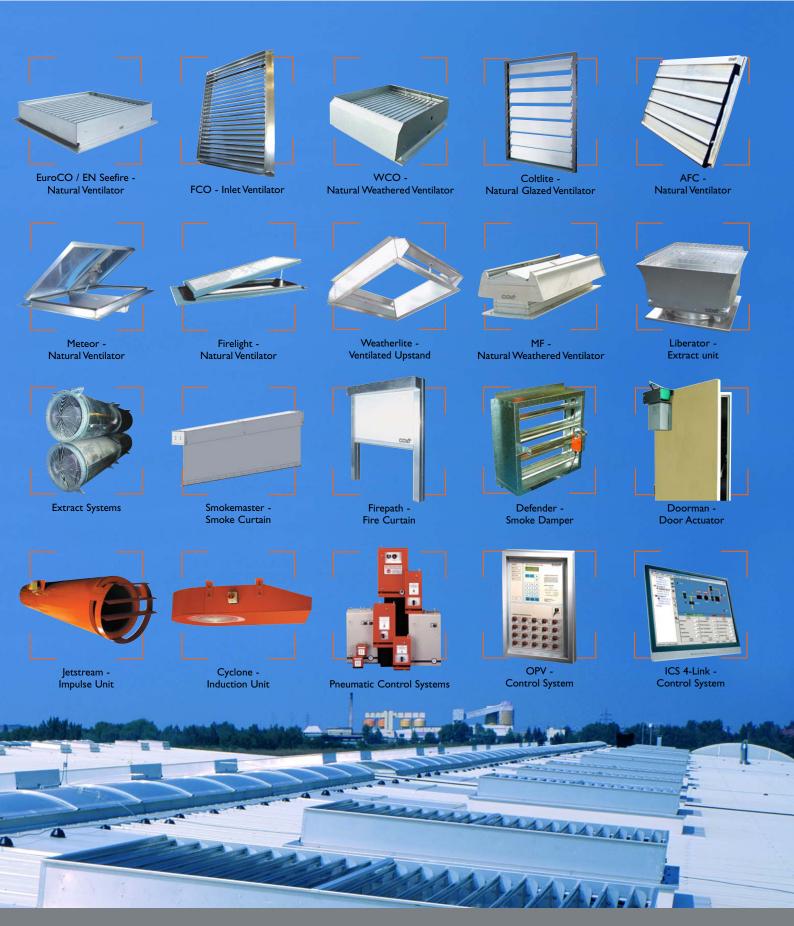
## Colt fire protection systems Innovation instead of imitation

Main picture: Candy Podborany (CZ)



There are many ways to improve the level of protection against fire. That's why it makes sense for Colt to offer a custom design or solution to a problem in order for that design or solution to be effective and efficient.

Colt smoke control systems can be integrated into any Building Management System, which can bring about additional benefits.



"Colt has a wide portfolio of smoke control systems, from mechanical and natural smoke ventilators, to smoke and fire curtains and impulse ventilators."



## We make use of natural daylight

#### HERE COMES THE SUN

Natural daylight has a positive influence on the health and attitude of human beings. An increase in natural daylight reduces the chance of accidents and increases people's concentration. In addition by using natural daylight in the right way the cost of artificial lighting can be greatly reduced.

Another factor is the fact that natural daylight changes in colour and intensity continuously. Designers and users of the building are well aware of how the changes in light can influence the internal "feel" of a building. Further-more architects naturally like to create buildings that evoke interest and admiration.

Therefore designers strive to achieve a maximum of natural daylight in buildings, particularly where people are at work. Accordingly there are examples of buildings with large areas of glazing that can be seen nearly everywhere.

On the other hand too much daylight in the wrong places can lead to glare. And the use of large glazed building envelopes can give rise to problems as the result of the need to provide extensive cooling in summer, and they can lead to excessive heat loss in winter.

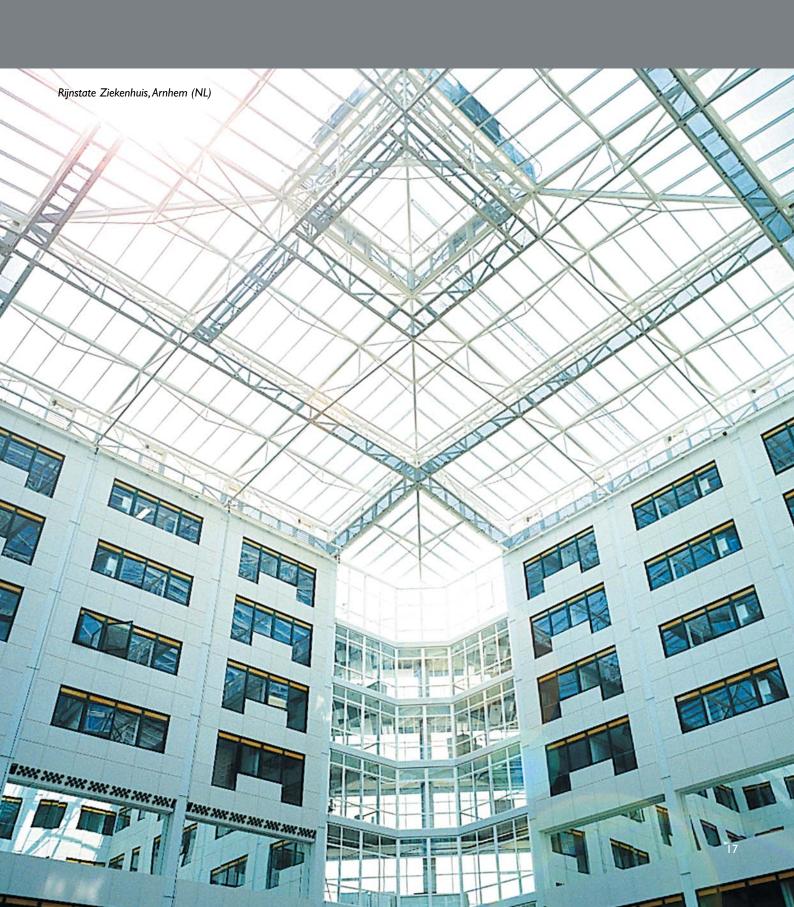
With the drive towards reducing energy consumption, a key objective for most building designers is to maximise the use of natural light without the problems of excessive solar heat gain and winter heat loss.

Colt can provide integrated glazing and shading solutions to meet these challenges. You can see some examples on the next page.

### FEATURES AND BENEFITS OF COLT GLAZING SYSTEMS

- Provision of health enhancing day light
- Reduction of the costs of artificial lighting
- Reduction of glare
- Enhanced aesthetic appeal of the building

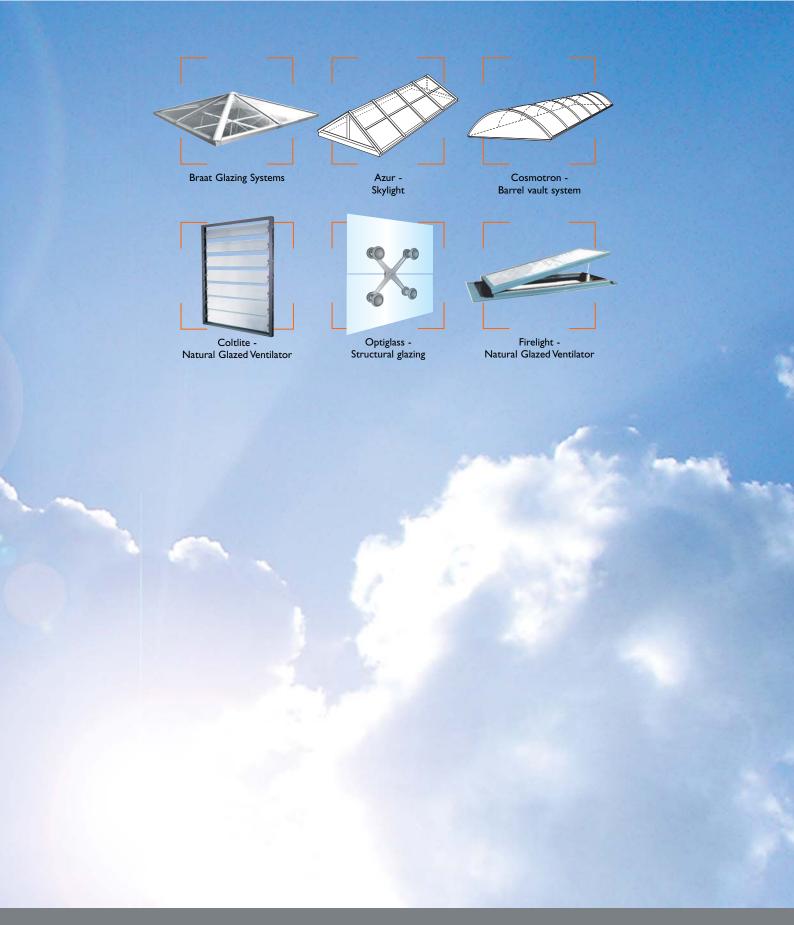
"Natural daylight is unsurpassed in its positive ergonomic influence, and the requirement for it provides architecture with potentially massive impact."



## Colt glazing systems Added value through the combination of systems

Colt offers a complete design, manufacture, project management and installation service to Architects and Contractors for glass rooflights and structural glazing. A wide variety of forms, shapes, glazing types and profiles can be accommodated. Single and double pitches, with or without sides, pyramids, and rounded glazing elements. Profiles may be polyester powder painted, anodised or mill aluminium. Certificates for type testing by third parties are available on request.

Colt can offer simulations of how solar shading and daylighting will interact within a specific model. Moreover, Colt's range lends itself to integration with other Colt products such as solar shading louvres and ventilators.



"Colt glazing systems are designed to incorporate external solar shading and natural ventilation equipment if required."



## We control natural daylight

#### INDIVIDUALITY NOT CONFORMITY

Architectural trends have moved towards creating buildings with large areas of glazing. This has been made possible by significant innovations in building materials as well as technologies that control the level of comfort within a building.

Buildings with large areas of glazing make the best use of natural daylight and passive solar heat. However they also suffer from the disadvantages of excessive heat loads and glare. Originally these disadvantageous effects could be countered simply through larger and larger air conditioning systems. Nowadays both the relatively high operating costs of a building and ecological concerns make it attractive to install an advanced solar shading system which can reduce solar heat gain whilst maintaining acceptable levels of natural daylight.

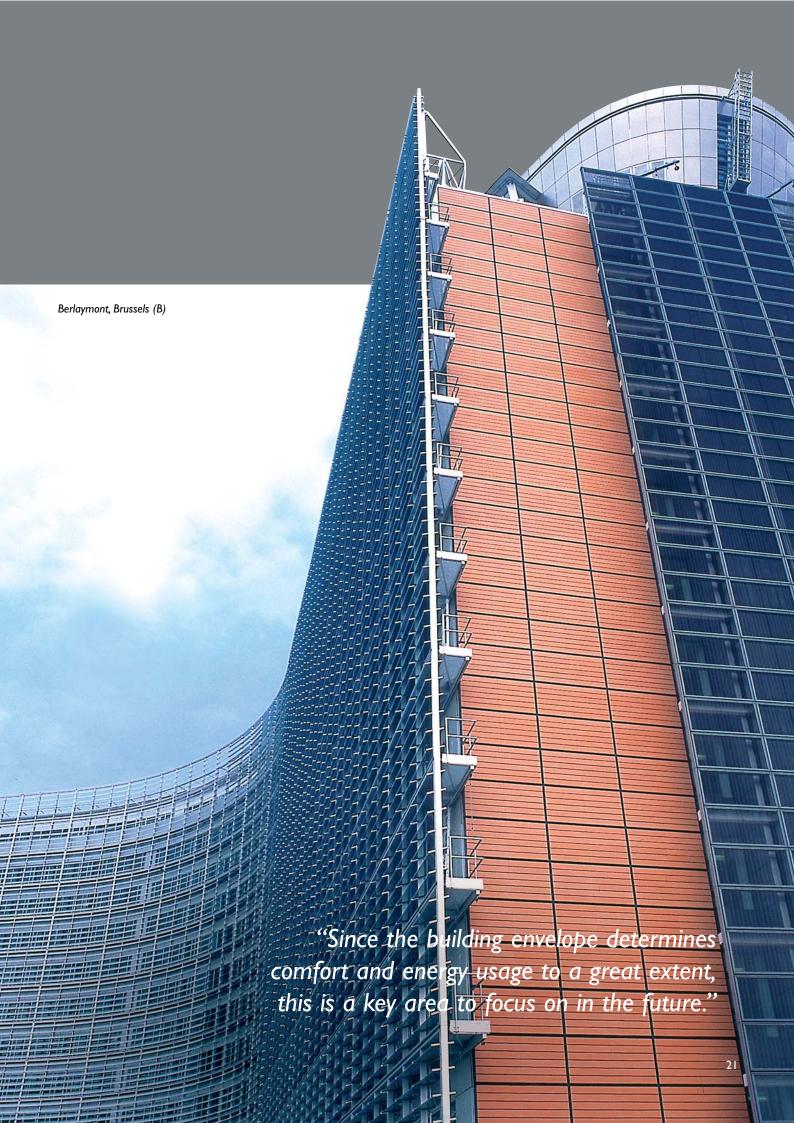
External solar shading is the most effective way to control the internal conditions of a building. Radiation from the sun is partially absorbed and reflected by the solar shading louvres. As a result solar heat gain is prevented from passing into the building, reducing ventilation requirements or cooling loads. In the summer months, the building is protected against overheating by adjustable reflective louvres that are controlled in accordance with the position of the sun. In the winter months, the louvres may be positioned so as to reduce heat loss as well as to enhance any heat coming from the sun.

At the same time as daylight levels are enhanced, levels of glare can be reduced.

Colt's offer can include calculations of sun angles and heat loads, and the selection of the most appropriate system from a wide range of options. Colt will work with the designer to produce a solar shading system that meets both the aesthetic and functional requirements of the project.

### FEATURES AND BENEFITS OF COLT SOLAR SHADING SYSTEMS

- Optimum performance by reducing solar heat gains whilst maintaining acceptable levels of natural daylight
- At the same time as daylight levels are enhanced, levels of glare can be reduced.
- Reduction of cooling loads in summer
- Reduction of heating requirements in winter
- Potential for striking aesthetic impact
- Potential to integrate photovoltaic



## Colt solar shading systems Colt is the competent partner for solar shading systems

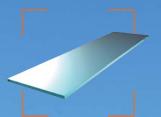
Main picture: Schwenniger BKK (D)



There are few areas in which a designer can be so creative as with solar shading. The challenge is to maximise the impact of both function and form. Colt specialises in bespoke design solutions, such as is shown in the project shown above.

The range of options is enormous. Shading louvres are available in various configurations, materials, finishes and coatings to meet the requirements of almost any project.

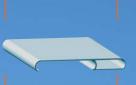
Besides aluminium and stainless steel profiles, there are all manner of glass, textile, wood, terracotta clay and translucent acrylic louvres available depending upon aesthetic and energetic requirements. Glass louvres can be fitted with electricity generating photovoltaic panels.



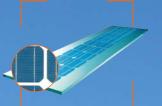
Shadoglass -Solar Shading System



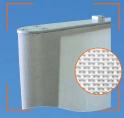
Solarfin -Solar Shading System



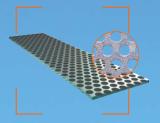
Solar C -Solar Shading System



Shadovoltaic - Solar Shading System with Integrated Photovoltaic Cells



Shadotex -Textile Solar Shading System



Shadometal -Solar Shading System



Soltronic -Control System



ICS 4-Link -Control System



Girasol - Autonomous Sun Tracking System



"Colt can assist the designer to combine solar shading with the optimisation of natural daylight, energy saving and façade design."



#### Refurbishment

## REFURBISHMENT IS MORE THAN RENEWAL

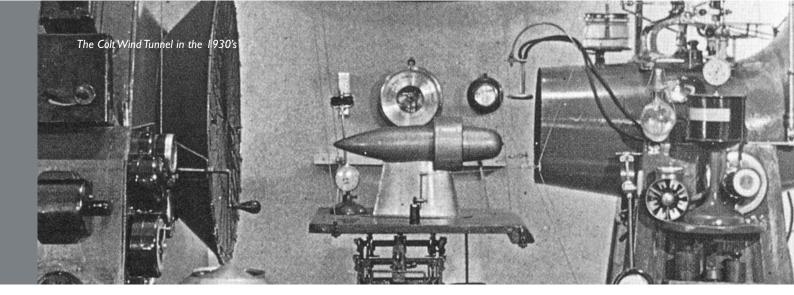
When a building is refurbished, there is a good deal of potential to be unlocked. Refurbishment generally will require a new facade, thereby unlocking potential for improvements in energy performance as well as enhanced appearance. Fire protection measures can be improved thereby making it a safer place to occupy. Energy costs can be reduced by better techniques, and there is the opportunity to integrate a renewable source of energy, such as photovoltaic cells, or heat reclaim.

Colt has extensive experience of renovation projects. The approach is to look at every situation individually and to examine both aesthetic and energetic aspects for opportunities for improvement and optimization.

A good example of a successful renovation project carried out by Colt is the Berlaymont Building, Brussels, to be found on page 20.

"The value of a building can be greatly enhanced through renovation. At the same time it can be made a safer, more productive and more attractive place to live and work in."





## Research and Development - from hypothesis to reliable facts

### TO STAND STILL IS TO GO BACKWARDS

Colt invested in research facilities right from its very beginnings. The Company built a wind tunnel in 1931, the first year of its existence. It was technically advanced for it time and was initially used to develop vehicle ventilators. Over the years Colt has delivered a constant flow of new ideas that have led to the development of new products and services.

Since the 1930's Colt has developed test facilities in the UK and Germany, and has carried out hundreds of tests, whether for the development of its own products or to test how well these products perform when integrated into a customer's building under differing conditions.

Colt's test facilities include testing of air permeability, water tightness under static pressure, aerodynamic performance, coefficient, air leakage for ventilators and louvre panels; a life cycle area; a fire test rig; and an acoustic facility consisting of two connected test cells (reverberant and semi-anechoic). Other test capabilities include freeze testing, "fall through" tests and structural wind load testing.

### COLT'S CONTRIBUTION TO THE SCIENCE OF SMOKE CONTROL

Colt played a significant part in the development of the science of smoke control. Following a series of catastrophic fires in the 1950's, Colt worked with the Fire Research Station at Borehamwood, near London, to fund a series of full scale tests. These led to the publication of Fire Research Technical Papers 7 and 10 which are the basis for the science of smoke control.

"A constant flow of new ideas, underpinned by research and development, that have led to the development of new products and services."





#### We offer an all-round service

#### WHAT DO WE MEAN BY "SERVICE"

Colt's service does not start with the customer's order. Colt can provide design input following the initial meeting with the client. With existing buildings, Colt can provide a no-obligation survey which can cover the measurement of temperature, energy losses, heating parameters, air movement, noise, and so on. For smoke control schemes Colt can provide heat and smoke modelling. Where applicable all relevant data can be run through a computer fluid dynamics (CFD) model or run through a series of calculations.

Colt also offers a series of professional "CPD" (Continuing Professional Development) seminars that can be carried out at the client's premises on a variety of subjects, from air conditioning to smoke control through to solar shading. From time to time Colt also holds regional seminars. We welcome requests from clients to visit buildings where they can see the Colt equipment installed and operating.

#### **SERVICING**

Colt recognizes the importance of firstclass after sales service. Colt's service teams offer a fast response, round the clock service to supporting both Colt's own and other manufacturers' products.

#### MAKE USE OF COLT'S SYNERGIES

Colt makes it a speciality to work with Architects, Consulting Engineers and Owner Occupiers at the earliest conceivable stage.

An intensive level of contact at this early stage enables all aspects of the project to be considered, and gives a high level of confidence that the project will be executed without a hitch.

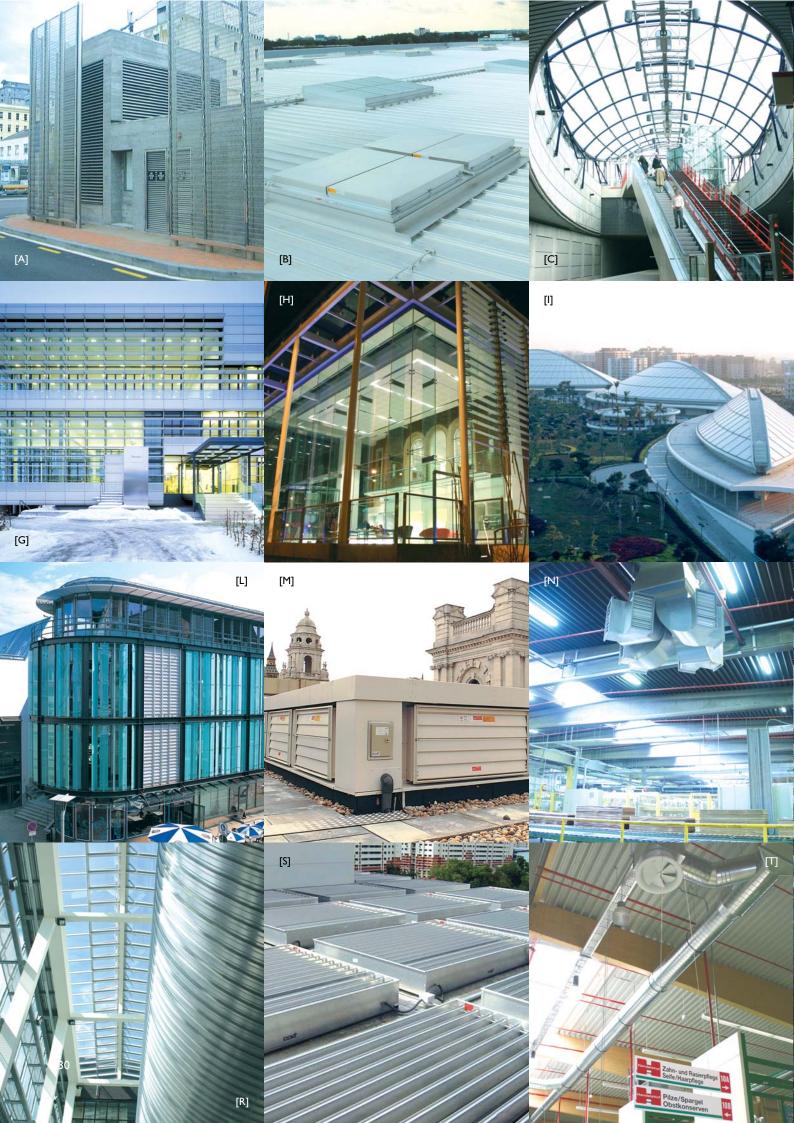
Whether the project concerns an existing or new building, Colt offers the complete package: competent problem solving and advice, project management, and the design, supply, installation, commissioning and maintenance of systems.

Colt is represented around the world in the form of a network of wholly owned subsidiaries, joint venture companies, agents, manufacturing licensees and distributors.

Please visit **www.coltgroup.com** for more information about the location of Colt's local offices, or to find out more about Colt's products and services.

"Colt advocates an integrated approach to problem solving, with an intensive level of contact with Architects, Consulting Engineers and Owner Occupiers at the earliest conceivable stage."







## COLT INTERNATIONAL - A COLT GROUP COMPANY

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Colt offers an in-depth knowledge of a wide spectrum of technologies relating to fire protection, air movement, solar control and daylight control for both new and refurbished buildings.

This is underpinned by many years of experience, born both out of research and development and practical experience. We hope that this give you enough reason to contact us.

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"People feel better in Colt conditions

