Colt in Education

*Environmental Solutions for Educational Buildings*
With sustainability and energy efficiency in mind, many educational buildings are designed to be naturally ventilated. Natural ventilation harnesses the freely available elements of wind and heat to move air through a building. Natural ventilation can be effective whilst offering reduced capital, space and running costs compared to conventional air conditioning.

Colt’s natural ventilation systems concentrate on automatically opening and closing windows, ventilators and rooflights in a controlled manner. The systems can range from a simple open / close switch to a fully integrated energy management system, which could include carbon dioxide measuring, internal and external temperature measuring, external weather sensors as well as interfaces with building management systems.

Whether the requirements are for day-to-day ventilation or a combination of day-to-day ventilation with smoke control, or a hybrid system of mechanical and natural ventilation, Colt can provide the solution.

Colt is able to offer a total solution to its clients from assistance at concept stage through to the installation of the system and beyond to service and maintenance.
Smoke prevents people from escaping and makes it difficult for the fire brigade to see where the source of the fire is. Colt’s smoke control systems ensure that if there is a fire, smoke is contained and removed, allowing safe evacuation and fire-fighting.

Building Bulletin 100, Design for Fire Safety in Schools, applies to nursery schools, primary and secondary schools, academies and city technology colleges, special schools and pupil referral units. It is the normal means of compliance with Building Regulations for fire safety design in new school buildings and sets out the DCSF policy on fires within schools.

With Smoke Control Ventilation, the detailed design guidance mainly relies on containment by walls and doors to prevent smoke from entering escape routes. Automatic smoke control systems (triggered by an automatic detection system) can achieve the same ends, by extracting smoke from the building. This provides benefits for means of escape and also facilitates access by the Fire and Rescue Service. It is important to note that most natural ventilation solutions can be utilised for dual purpose smoke control with little design change.

Colt can provide a premium design service from initial bid through to final negotiation. When it comes to educational buildings, Colt’s unique breadth of expertise and product range spans across the specialities of smoke control, climate control, solar shading and glazing systems. We design, manufacture, install and commission each system, and importantly, make them work in harmony with each other.
COLT IN EDUCATION - SOLAR SHADING SYSTEMS

SOLAR SHADING

Controlled natural daylight is critical for any educational facility. Colt solar shading systems offer designers the opportunity for distinctive architectural impact, whilst reducing solar glare and solar heat gains.

The need to provide extensive cooling in summer and insulation in winter inevitably arise with today’s modern buildings.

Colt design a wide variety of fixed and movable solar shading systems that optimise the flows of heat and light energy. This in turn may have a positive effect in reducing the heat load and glare, into the learning spaces enhancing the use of natural daylight. This helps enhance internal working conditions for both staff and students.

St Aloysius’ School, Glasgow
The new Junior School for St Aloysius’ was designed by Glasgow based architects Elder and Cannon and incorporates Colt’s Shadoglass Solar Shading System

University Library, Portsmouth
A new three-storey extension has been built, designed by architects Penoyre & Prasad and includes a bespoke solar shading system and hidden natural ventilators

Tanaka Business School, London
When the Imperial College in London asked Foster and Partners to redesign the “black tower” portion of their flagship Tanaka Business School building on Exhibition Road in London, Colt were consulted with regard to the design of a glass louvred veil to conceal the existing concrete structure, whilst allowing daylight penetration to the fenestration behind.
Designing natural ventilation solutions is of paramount importance when it comes to education building design. But what energy efficient option could you consider for heating (or even boost cooling for those occasional hot summer days)?

The award winning Caloris WRF (water and refrigerant flow) water source heat pump system can be installed in the classrooms with de-centralised local control to provide both heating during the winter and boost cooling in the summer where the heat loads are expected to become too high for natural ventilation. WRF offer customers a more efficient and effective option than traditional VRF and fan coil systems that provide both performance and environmental benefits.

The Colt WRF system is based on reverse cycle water source heat pump technology and uses water rather than refrigerant as its main energy transfer medium. Local units are linked together by this neutral temperature water loop to form a complete system. Refrigerant charge is minimal and local to the Caloris unit, so it is not affected by the forthcoming F Gas regulations.

Caloris Indoor Units have a EER of between 3.7 and 6.4 and an Outdoor Unit has a EER of between 3 to 5 in winter and 4 to 5 in summer and can make use of the building mass, PCM (phase change material) or even a water reservoir (e.g. via a GSHP system) as a heat sink for both heating and cooling.

Caloris WRF can be seen operating at Sheffield University (Alfred Denny Building), Hatchcroft University, Farnborough 6th Form College and many other buildings throughout the UK and Europe.

* Colt International Ltd has won the prestigious H&V Environmental Initiative of the Year Award 2009 for its development of the WRF Caloris system combined with ground source, for Hatchcroft University in Middlesex

* www.desingguidanceforschools.co.uk

Colt controls allow the automatic opening and closing of Colt window actuators and ventilators in case of high internal temperatures, smoke detection or CO levels in conjunction with external rain or wind alarm conditions detected by optional sensors.
COLT IN EDUCATION - TRACK RECORD

TRACK RECORD

St Christopher’s School
University of Portsmouth
University of London
Harefield Academy
St Matthew’s Academy
Harris Academy
St Matthew’s Academy
University of Leeds
University of East London
St Matthew’s Academy

www.designguidanceforschools.co.uk
Blackburn Sixth Form College  
Canterbury Christchurch University  
Carmel College  
Cleeve School  
Cranfield University  
Edinburgh University  
Eyemouth High School  
Farnborough Sixth Form College  
Gladsmore Sports Centre  
Harris Academy  
Heathfield University  
Heriot Watt University  
Hertford Regional College  
Holyrood School  
James Square University  
Kingsley College  
Knowsley Schools

London School of Economics  
London School of Hygiene  
Malvern St James School  
Merryilee Primary School  
Middlesex University  
Napier University  
Oakington Manor Primary School  
Petchey Academy  
Peninsular Dental School  
Queen Margaret University  
Sheffield University  
Sherborne School  
Southampton University  
St Christopher’s School  
St Matthew’s Academy  
Tanaka Business School  
Telford College

University of Bristol  
University of Coventry  
University of Dundee  
University of Glasgow  
University of Hertfordshire  
University of Leeds  
University of Plymouth  
University of Portsmouth  
University of St Andrews  
University of Strathclyde  
University of Sunderland  
University of Worcester  
Uxbridge High School  
Woodbridge Sixth Form College  
Walthamstow Academy  
Warwick University
Farnborough 6th Form College

The Sixth Form College, Farnborough is one of Britain's top sixth form colleges. It has sought to retain and build upon its reputation as a distinguished major provider of the highest quality academic and vocational education.

Project Brief
To provide natural ventilation with dual purpose smoke control protection and winter heating to classrooms, atrium and corridors.

Project Location
Farnborough, UK

Colt Solution
Caloris WRF heat pump air conditioning units have been installed in the classrooms where the heat loads may at times become too high for natural ventilation. Caloris WRF has been designed to automatically function with the Colt natural ventilation system.

Colt Products
Colt window actuators
ColtLite glazed ventilators
Roof turrets
Caloris WRF
ICS4 Link controls
Kameleon glazed roof ventilators

Architect
Broadway Malayan

Main Contractor
Bowen PLC

M&E Contractor
Walsh Mechanical and Electrical

Actuators controlling both high & low level windows
Caloris WRF unit installed within purpose built bulkheads

Roof top double bank louvre turrets with internal controllable dampers to regulate the flow of air and eliminate rain entry.
Hatchcroft University

Colt has successfully linked its WRF air-conditioning system, Caloris, with Ground Source Heat Pump (GSHP) technology, to provide an energy efficient HVAC solution for the Hatchcroft building, a new, multi-million pound teaching and research facility, for Middlesex University.

The building, which has a capacity of 1,100 staff and students, has been designed to be both adaptable and sustainable, accommodating laboratories for Biomedical teaching and research, classrooms and associated facilities for Psychology, Computing and Sports Sciences.

Built in place of six, now demolished, buildings, the new development has achieved a 12% reduction in CO2 emissions. Colt Caloris linked to GSHP was chosen as an energy efficient solution to assist in this reduction, as well as generally contributing to the University’s ambition of achieving an “Excellent” BREEAM rating.

Throughout the building, 59 Caloris indoor units have been installed connected to a vertical, closed loop borehole, GSHP system. Taking up an area of approximately 1,400 m², 55 boreholes have been drilled to an approximate depth of 60m, accommodating the GSHP’s 32mm coil arrangement. The resultant HVAC solution can provide a capacity of up to 235 kW gross peak heating load and 190 kW net peak cooling load.

Colt was awarded this contract due to its ability to help integrate the complete package of works, from the design and installation of the GSHP system, to providing the link between the ground and the indoor Caloris WRF units.
COLT IN EDUCATION - PRODUCT SOLUTIONS

PRODUCT SOLUTIONS

Natural Ventilation

- COLT NFV
  Natural facade ventilator

- COLTLITE
  Natural glazed louvred ventilator

- UNIVERSAL LOUVRE
  Screening or ventilation louvre

- CALORIS WRF
  Water source heat pump

- LOUVRE TURRET
  Ventilation louvre

- WINDOW ACTUATOR
  Automatic opening device

Smoke Ventilation

- EN SEEFIRE
  Natural louvred ventilator

- METEOR
  Natural flap ventilator

- LIBERATOR
  Mechanical smoke extract ventilator

- DEFENDER 1/2
  Smoke & fire damper

- KAMELEON
  Natural glazed flap ventilator

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SHADOMETAL
Fixed or movable sheet metal louvre available in a wide range of patterns and finishes

SHADOGLASS
Glass louvre available in a range of tints, frits and clamping systems

SOLARFIN
Fixed or movable elliptical extruded aluminium louvre

BRISE SOLEIL
Fixed shading louvre

TIMBER LOUVRES
Fixed or movable wooden louvres

COLT CONTROLS
Other control options available

WIND SPEED DETECTOR

TEMPERATURE SENSOR

RAIN SENSOR

CO SENSOR

SMOKE SENSOR
THE COLT PACKAGE

Colt offer the following services:

Free no obligation survey.

Free no obligation design and advisory service.

Detailed scheme design for natural ventilation, smoke control and solar shading systems.

Caloris WRF heat pump air conditioning system design and supply.

Integrated solar shading systems with sun tracking louvres which can be integrated into any ventilation scheme design via our own sophisticated controls.

Provision of performance specifications.

Project and site management.

Supply, installation, commissioning and maintenance of all Colt Systems.

OTHER REASONS TO CHOOSE COLT

Quality and safety underpin all our activities. We operate to strict quality and environmental standards including ISO 9001 and ISO 14001.

Over 75 years experience in the design, manufacture & installation of heating and ventilation systems.

Our innovative attitude and capability is backed up by our own manufacturing and test facilities.

OUR MISSION STATEMENT

To meet the building occupiers’ expectations of a comfortable and safe working environment utilising energy efficient products with the desire to be in full control of this environment at all times.