

**COLT COOLSTREAM S**  
EVAPORATIVE COOLING  
& VENTILATION SYSTEM

Wistron, Czech Republic.



**COLT**

Image:  
Plastisol, The Netherlands.

Air distribution system below  
a CoolStream S unit



## COOLSTREAM S: EVAPORATIVE COOLING & VENTILATION SYSTEM

Image:  
Arla Foods, The Netherlands.



### DESCRIPTION

Colt CoolStream S is a natural cooling and ventilation system which employs the principle of evaporative cooling.

This is an efficient and effective alternative to conventional air conditioning, particularly with storage or production facilities, where these buildings are generally simply too large for conventional air conditioning to be cost-effective.

CoolStream S draws hot air across wetted media, thereby exchanging energy and reducing the internal air temperature. The warmer and drier the outside air, the more efficiently evaporative cooling functions.

Where outside temperatures are above 30°C, the entering air can be cooled down by 10°C or more.

In addition evaporative cooling involves supplying 100% fresh air, thereby maintaining good air quality. This means that CoolStream S evaporative units may be used throughout the whole year providing fresh outside air, with the

cooling function only being operated when conditions dictate. At the same time the hot air inside the building is normally removed at high level by natural or mechanical ventilators, providing a pleasant temperature at working level.

Even when the internal space is large, CoolStream S systems lend themselves to be retrofitted into existing HVAC/ventilation plant, where such plant cannot ensure a comfortable internal working climate.

CoolStream S is well suited to industries such as plastics, metal or food and for installation in warehouses, shopping centres, leisure and exhibition centres, and data centres.

Being environmentally safe, with low installation and very low running costs, CoolStream S is a reliable system with good green credentials, using proven, non-complex technology.

Colt offers a complete design and build service including ductwork, controls and maintenance.

Colt can provide advice on all aspects of design, installation and efficient running of such systems.

### FEATURES AND BENEFITS

- Evaporative cooling is between four and seven times more economical than conventional air conditioning, with lower initial costs.
- Low cost of operation and maintenance, with a power consumption of only around 1kW and 50 litres of water per 10,000m<sup>3</sup>/h of supplied air – more than 30 kW cooling power.
- An evaporative cooling installation can consume less than 10% of the electricity used by an equivalent rated refrigeration based cooling system.
- Corrosion resistant aluminium.
- All parts which come into contact with water are double powder coated in addition.
- Free from refrigerants.
- Integrated water quality system. Safe circulation with temperature control and regular renewal of water to avoid the growth of bacteria and scale. CoolStream S has been extensively tested and certified hygienically in compliance with VDI 6022 ("Hygienic Requirements for Ventilation Systems and Units for Internal Spaces"). This is a rigorous standard for air conditioning systems and confirms the high quality of supply air.
- A choice either of axial AC fans or high efficiency EC fans, in two speed or variable speed options.
- Low noise.
- Fully automatic digital touch screen controls with master/slave operation for up to 16 units with easy control routines. Optional link to a building management system.
- Only 100% outside air used, so no stuffy internal air is re-circulated.



Image:  
Bike Fun,  
Koprivnice, Czech Republic.

## APPLICATIONS

Image:  
Bosch Rexroth, Glenrothes, Scotland.



### APPLICATIONS FOR THE COOLSTREAM S

CoolStream S is especially suited to those buildings which require a cost-effective cooling system for larger spaces, whether industrial or commercial, which do not require an absolutely constant internal temperature at all times. It is especially effective for conditioning areas which produce a fair degree of heat. Its applications are very wide and include:

- Plastics, metal and food industries
- Warehouses
- Data centres
- Transformer buildings
- Exhibition halls
- Shopping malls

In addition, CoolStream can be used for air humidification, for example in the paper and printing industry.

We can advise you on all aspects of how to apply CoolStream S systems.

### COOLSTREAM S IN DATA CENTRES

Data centres depend on a system that maintains temperature and humidity levels within an allowed range, operating round the clock. IT equipment operating environment specifications have recently been revised, opening the way to evaporative cooling in data centres. Evaporative cooling provides a highly effective solution for such buildings, with low installation and running costs, minimal maintenance requirements and quiet operation.

The CoolStream S has been proven to provide a reliable solution for many years for demanding industrial environments. Its industrial grade components make it the best in its class.

CoolStream S is suitable for both new build and existing data centre refurbishments.

For further info, visit our blog at: <http://blog.coltinfo.co.uk> or consult with Colt for further information.

### LIMITATIONS OF APPLICATION

CoolStream S needs a suitable environment for it to be able to perform correctly.

It should not:

- Be allowed to draw in air which is unusually humid or containing unusual amounts of particulates.
- Operate with rain water, distilled and demineralised water or with unhygienic drinking water.
- Be used for the cooling of spaces without the provision of exhaust air or spaces either with significant over or under-pressure.
- Be used in spaces in which low humidities are needed or where there are corrosive gases.

Consult with Colt for further information.



### HOW MUCH CAN COOLSTREAM S REDUCE THE TEMPERATURE?

		OUTDOOR RELATIVE HUMIDITY			
		20%	30%	40%	50%
OUTDOOR TEMPERATURE	20°C	10°C	12°C	14°C	15°C
	24°C	13°C	15°C	17°C	18°C
	28°C	16°C	18°C	20°C	22°C
	32°C	18°C	21°C	23°C	25°C
	36°C	21°C	24°C	26°C	28°C
	40°C	24°C	27°C	29°C	32°C

The temperatures shown are the supply air temperatures

#### EXAMPLE:

At an outdoor temperature of 32°C and an outdoor humidity of 40%RH, CoolStream S will maintain a supply air temperature of 21°C and a room temperature of around 26°C.

The room temperature is very much dependent upon the design.

Image:  
STS Cugir, Romania.





## COOLSTREAM S HOW IT WORKS

Hot external dry air is cooled by the evaporative cooling principle. An axial fan draws external air over a wetted medium. This process significantly reduces its air temperature and where this process is combined with either natural or mechanical ventilation, working conditions are greatly improved.

The control system ensures that the internal space is maintained at the required temperature. CoolStream S is available in three sizes with three different connection options and six different types of fans.

CoolStream S is designed to ensure that water circulates safely and at the right temperature. The water is regularly changed to avoid the build-up of bacteria and scale.

CoolStream S does not contain any refrigerants which would be harmful to the environment.

There are many different options for controls, which are always included.

There is an "All Seasons" version providing ventilation, re-circulation (heat recovery) and cooling throughout the year.

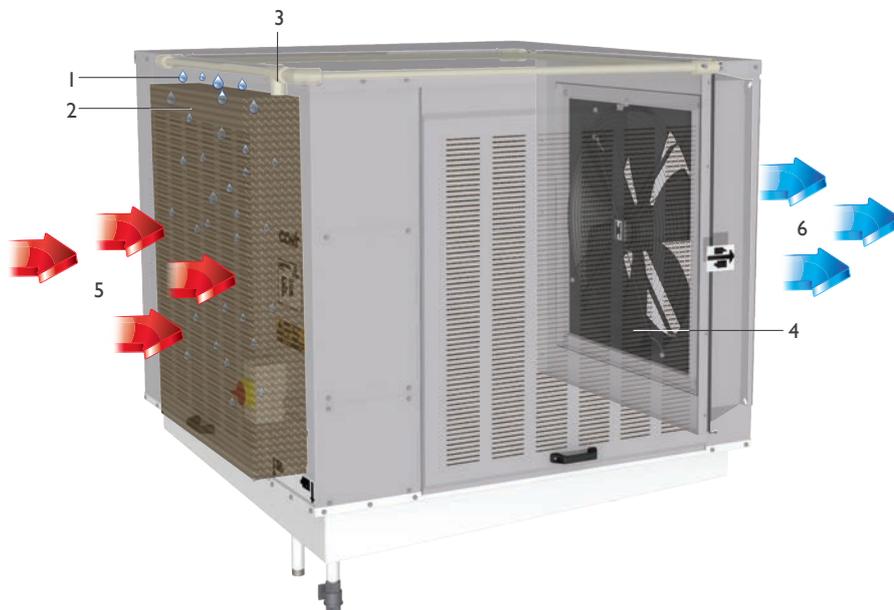
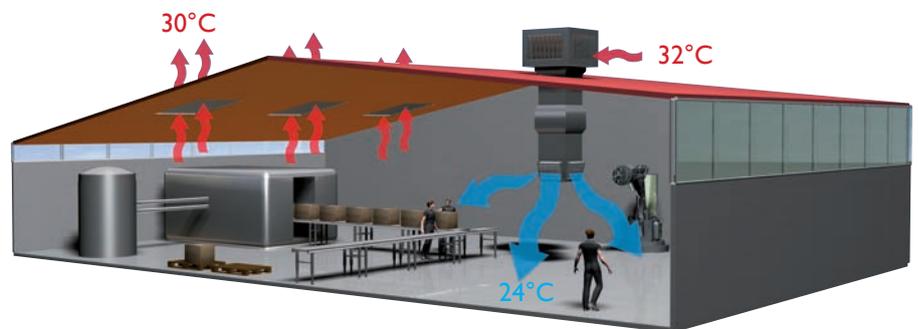
Image:

Weidenhammer Plastics Packaging, Germany.

Low level air distribution.

## LARGE INTERNAL SPACES

Large internal spaces such as production facilities are kept cool at a very low cost.



Hot external air (5) is drawn by an axial fan (4) over a desorption medium (2). This medium is kept continuously moist by the water supply system (1), (3). Combined with either natural or mechanical ventilation, this can result in a great reduction in air temperature (6).



CoolStream S has been certified in accordance with the requirements of VDI 6022.

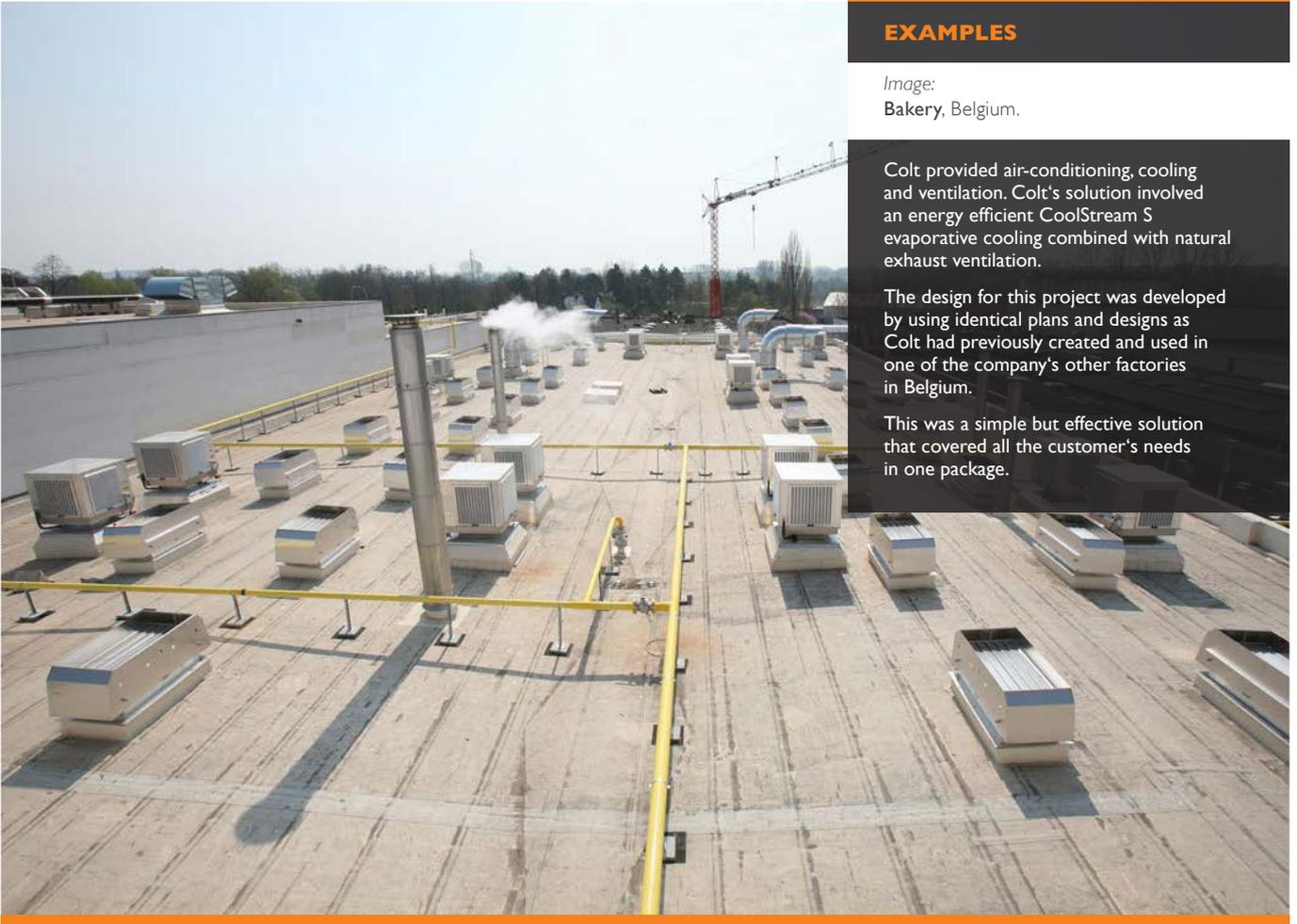
## EXAMPLES

*Image:*  
Bakery, Belgium.

Colt provided air-conditioning, cooling and ventilation. Colt's solution involved an energy efficient CoolStream S evaporative cooling combined with natural exhaust ventilation.

The design for this project was developed by using identical plans and designs as Colt had previously created and used in one of the company's other factories in Belgium.

This was a simple but effective solution that covered all the customer's needs in one package.



*Image:*  
Gealan Formteile GmbH, Germany.

Lowered energy consumption, lowered environmental impact. This mouldings company installed the CoolStream S following a review of its energy requirements for both factory and offices. Gealan had already had experience of Colt CoolStream S units. Their low initial and running costs made them the units of choice. Colt provided the design of a natural and mechanical ventilation system and also supplied a glazed roof.



*Image:*  
VCN Metal Processing Factory, Netherlands.

When this factory upgraded its machinery, the heat gains increased, and a solution had to be found which did not require the doors to be opened.

The customer chose a CoolStream S evaporative system in preference to conventional air conditioning due to its relatively low energy use and low maintenance costs.





CoolStream S 10

CoolStream S 16

CoolStream S 27

**1. COOLSTREAM S**  
SIZES

Size 10: 9,000 to 15,000 m<sup>3</sup>/h (2.5 m<sup>3</sup>/s to 4.2 m<sup>3</sup>/s)

Size 16: 15,500 to 22,500 m<sup>3</sup>/h (4.3 m<sup>3</sup>/s to 6.2 m<sup>3</sup>/s)

Size 27: 16,000 to 27,500 m<sup>3</sup>/h (4.4 m<sup>3</sup>/s to 7.6 m<sup>3</sup>/s)

Please refer to pages 10 and 11 for the exact dimensions.



[A]

[B]

[C]

**2. CONNECTION**  
OPTIONS

Where CoolStream S units are installed on to the roof, the bottom duct connection [A] is used. The cooled air is drawn into the room typically through a Coltair air inflow system.

Where CoolStream S units are to be combined with alternative HVAC equipment, the duct connection is usually to the side [B].

Where CoolStream S is installed adjacent to a building, the top duct connection [C] is generally used.

**3. FAN**  
OPTIONS

Six different types of fans are available. Please refer to the information on page 10 so as to make the correct choice.



**THE COOLSTREAM S THAT MAY**  
BE INTEGRATED WITH OTHER SYSTEMS

CoolStream S units may be provided without fans where they can be incorporated into other HVAC systems providing either direct or indirect evaporative cooling.



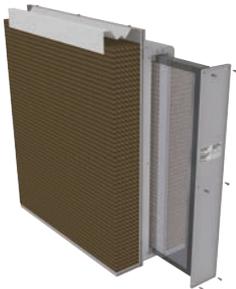
4, 5, 6



#### 4. STANDARD SIDE PANEL WITH DESORPTION MEDIUM:

Aluminium fins protect the medium from the effects of weather and the unique Z shaped configuration prevents light from entering the unit.

For high hygienic and thermal performance.



#### 5. OPTIONAL EXTENDED SIDE PANELS WITH DESORPTION MEDIUM AND INSECT GUARD

The insect guard stops insects and other small particles entering the unit. The amount of dirt on this guard is monitored remotely, allowing early cleaning.



#### 6. EXTENDED SIDE PANEL WITH DESORPTION MEDIUM AND FILTER

This unit is fitted with either a G4, M5 or F7 filter in accordance with EN 779: 2012. This option is fitted with a sensor which monitors the filter and shows a message remotely if dirt has built up.

**CONFIGURING  
COOLSTREAM S**

IN ACCORDANCE WITH  
YOUR REQUIREMENTS

Image:  
Crown Packaging, Slovakia.



**SIZE 10**

**CLASSIC**  
THE SILENT COOLSTREAM S

This has a sound pressure level (at 10 metres distance free field) of not more than 48dB(A) at full power with two speed operation. The size 10 fan type SA1 is the quietest CoolStream S available. To apply CoolStream S systems.

**PREMIUM**  
THE "ECO" COOLSTREAM S

The size 10 unit with fan type SE2 provides a volume flow of up to 4.1 m<sup>3</sup>/s (15,000m<sup>3</sup>/h) with continuous operation from 0% to 100% and is fitted with a highly efficient EC fan. This is a real energy saver and is well suited to operate with air filters. It provides a very accurate degree of internal air temperature owing to its infinitely variable speeds.

**SIZE 16**

**CLASSIC**  
THE GREATEST VALUE FOR MONEY

The size 16 unit with fan type SC1 is available with half and full speed delivering a maximum of 5.6 m<sup>3</sup>/s (20,000 m<sup>3</sup>/h). This provides the greatest amount of cooled air for your initial investment.

**PREMIUM**  
THE FULLY FLEXIBLE COOLSTREAM S

Providing the same features and benefits as the size 10 with fan type SE2, the size 16 with fan type SF2 provides an air volume of up to 6.1m<sup>3</sup>/s (22,000 m<sup>3</sup>/h) at an air pressure of 250Pa, whilst still having all advantages of axial fans.

**SIZE 27**

**CLASSIC**  
THE LARGEST COOLSTREAM S

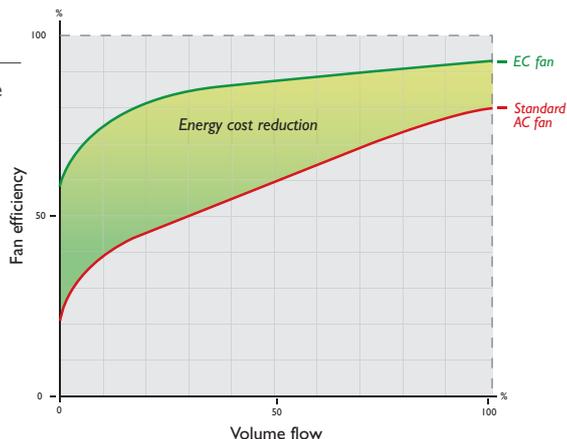
The size 27 unit with fan type SD1 provides the maximum air flow of up to 6.5 m<sup>3</sup>/s (23,500 m<sup>3</sup>/h) at two speeds and with a low sound level.

**PREMIUM**  
OUR BEST COOLSTREAM S

Up to 7.6 m<sup>3</sup>/s (27500 m<sup>3</sup>/h), silent and energy efficient at the same time! The CoolStream S size 27 with a fan type SG1 combines comfort and economic efficiency as never before.

**PERFORMANCE COMPARISON**

This chart shows the difference in performance of using EC fans compared to standard fans. Energy cost savings and a very low payback period are amongst the advantages of high efficiency EC fans.





## COOLSTREAM S "ALL SEASONS" OPERATION

Where a CoolStream S unit is combined with a Coltair inflow unit – which provides ventilation, heating and heat reclaim – then the internal environment can be controlled over the whole year.

Coltair is a modular, de-centralised unit which provides fresh conditioned air into the internal space as well as recirculated air when this is suitable. It is available in three different sizes and an abundance of different combinations.

Image:  
Bike Fun International, Czech Republic.

### SUMMER

During summer CoolStream S "All Seasons" maintains conditions to the set point.

### SPRING AND AUTUMN

Even in spring and autumn there can be a need for cooling, especially where there are high internal heat loads. If conditions permit, controls switch off the evaporative cooling therefore allowing fresh air only cooling.

The outside is mixed with the internal air to pre-heat the supply air, thereby preventing the incoming air from being too cold.

### WINTER

In winter it is likely that a fresh supply air and re-circulated air will be mixed.

If no residual heat is available, the re-circulation function switches to maximum inside air and brings the heat back down to the working area.

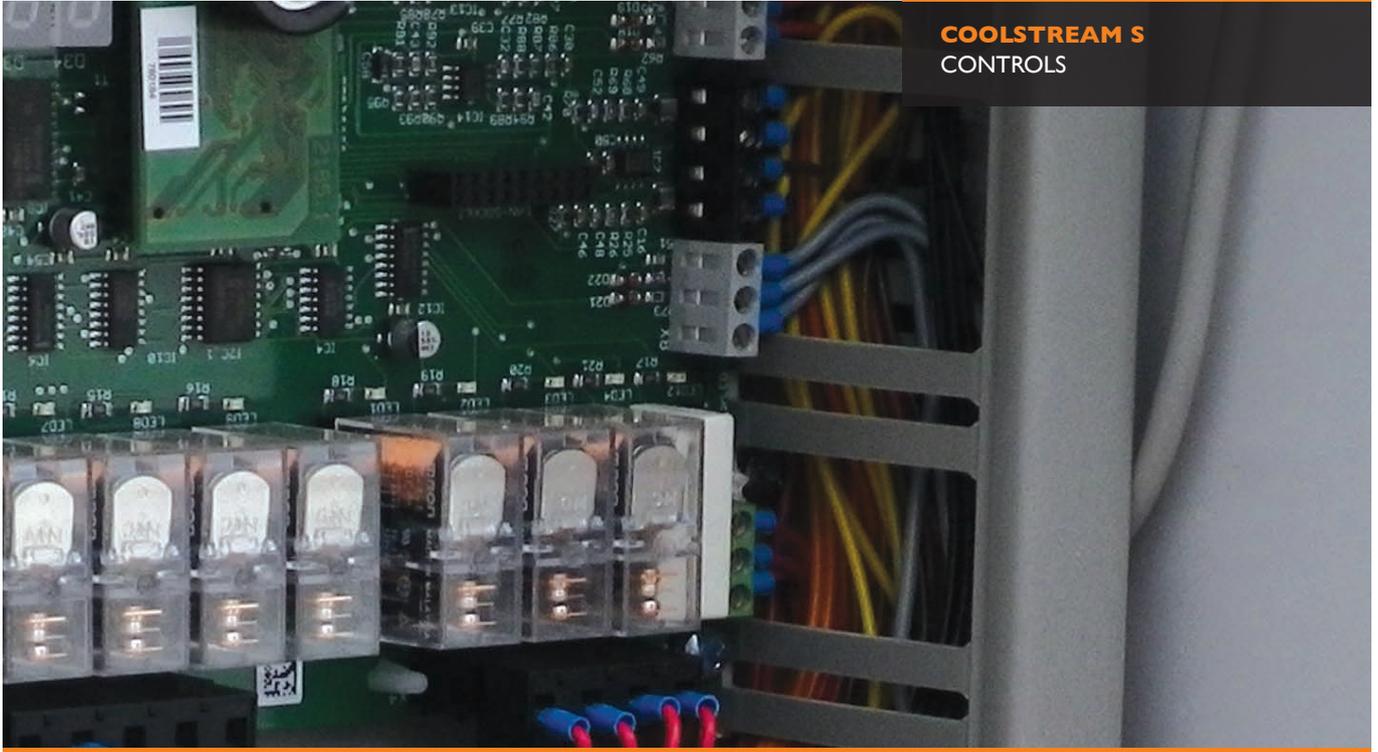
Where the amount of heat is not sufficient, Colt can provide an additional heating solution. The CoolStream S "All Seasons" distributes the heat efficiently round the internal space.



### DESIGN

Whether the building is new or existing, Colt can provide the design, project management and installation of CoolStream S units. The design includes the correct selection of components as well as an estimate of the running costs which comprise usage of energy and water as well as the cost of maintenance. Colt is able to compare any use Co2 emissions and running costs with conventional solutions.

As a result of this analysis Colt can demonstrate the savings that can be achieved as well as the potential for improved working conditions.



**TOUCH SCREEN CONTROLS**

Each CoolStream S has its own individual control unit to enable it to operate independently of other CoolStream S units. It is possible to connect a room sensor to each CoolStream S unit for zone control. In a typical configuration CoolStream units are connected together in a network of up to 16 units, whereby set point, operating mode and week schedule are synchronized. The central control comprises an easy to use touch screen interface.

There is the option to connect to building management systems such as modbus. Your Colt local office will advise you of the different options here.

**1. WATER CHECKED BY A TEMPERATURE SENSOR AND A GUIDED MICROWAVE LEVEL SENSOR**

- Frost protection in winter
- Overheating protection in summer
- Protection against limescale build up
- Automatic filling, emptying and drying

**2. AUTOMATIC CONTROL ROUTINES**

- Fan, supply valve, run off valve, fail safe circulation pump
- Optional: control of supply air damper recirculation air chamber and extract air

**3. FLEXIBLE SENSOR ARRANGEMENT – LOCAL OR BY REMOTE CONTROL**

- External and supply temperature
- Internal space temperature
- Internal space humidity

**4. EXTERNAL CONTROL FUNCTIONS**

- Forced stop or fire alarm
- Individual two bit digital input control of the fan and cooling functions.



Touching the operating mode symbols opens the start menu.



Touching the up and down arrows changes the desired air temperature.



**COOLSTREAM S**  
PROJECTS

Image:  
Rockwool Roermond, Netherlands.



Image:  
Arens Břecalv, Czech Republic.



Image:  
Crown Packaging, Slovakia.



Image:  
Plastisol, The Netherlands.



Image:  
Duwako, The Netherlands.  
Zwenkau, Germany.



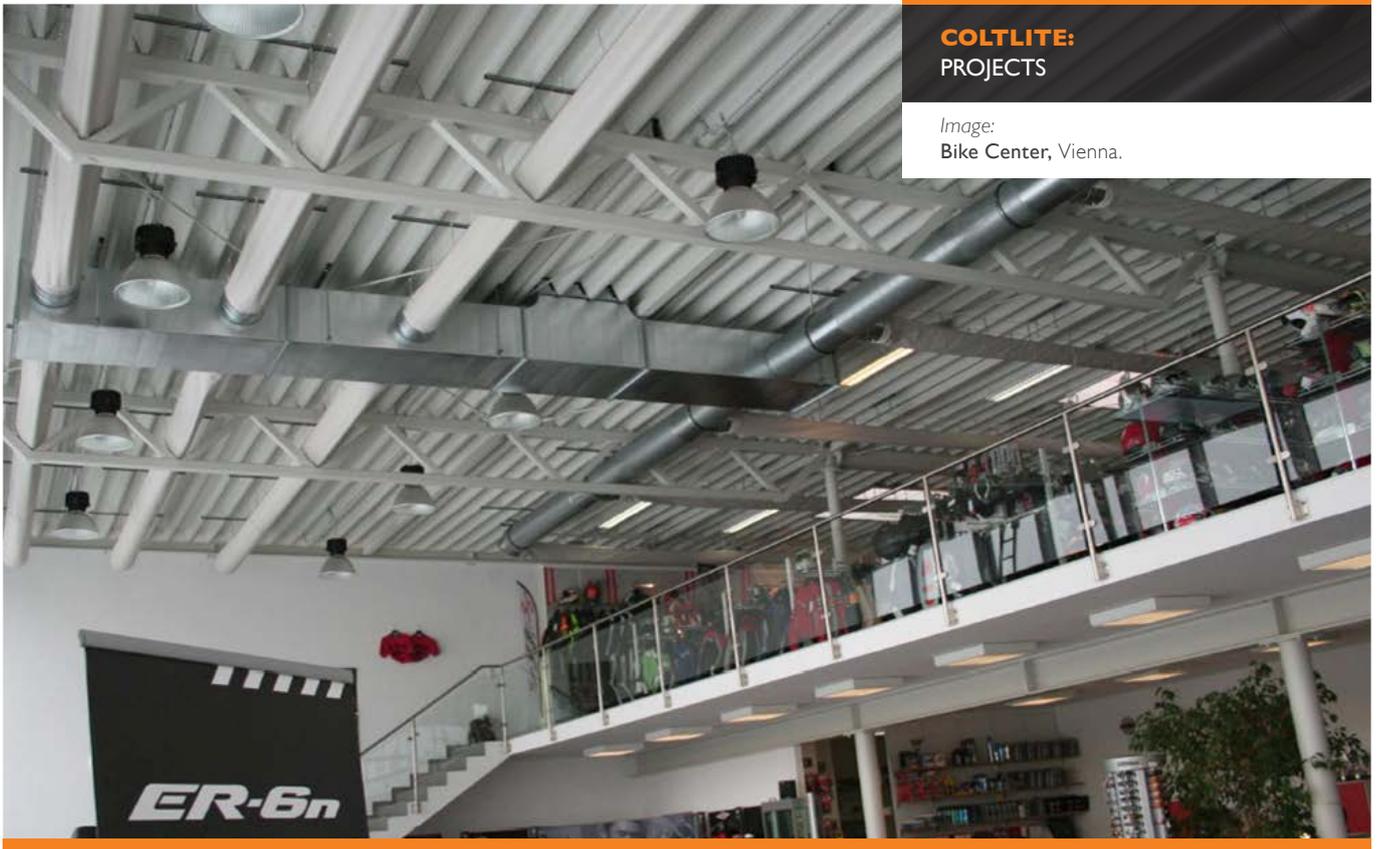
Image:  
STS Cugir, Romania.



Image:  
Avery Dennison, Hazerswoude,  
The Netherlands.

## COLTLITE: PROJECTS

Image:  
Bike Center, Vienna.



### COLT CLIMATE CONTROL SYSTEMS: CREATING A HEALTHY AND PRODUCTIVE INTERNAL CLIMATE

Colt Climate Control systems create ideal internal conditions by achieving the perfect balance of all the elements that determine the building's internal climate: temperature, humidity, air movement, solar intensity, condensation, noise, and solar intensity.

#### THE BENEFITS OF A GOOD INTERNAL CLIMATE

- Increased productivity and attendance resulting from a healthy and comfortable environment for the occupiers.
- Improved functioning and lower maintenance costs for production or IT equipment, as they operate in ideal conditions.
- Longer shelf life and safeguarding of product quality, as goods – from equipment to food or pharmaceuticals – are stored in ideal conditions.

### WE OFFER YOU PEACE OF MIND

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, as we:

#### LOOK AT THE COMPLETE PICTURE:

We know how a building works and have extensive in-house expertise in a broad range of technologies, including smoke control and performance louvre solutions and systems.

#### DESIGN

The most cost-effective, no-nonsense solution engineered to meet your needs and any prevailing regulations, relying on our full in-house technical resources such as CAD and CFD.

#### CUSTOMISE

Our products to fit the exact requirements of your project and, where necessary, have them specially tested at our R&D facility.

#### SUPPLY

Our high quality products, manufactured at our facilities under BS EN ISO 9001 and BS EN ISO 14001 quality certification and tested to rigorous international standards (CE marked where required).

#### INSTALL

Our experienced, professional project management teams will take care of everything.

#### MAINTAIN AND SERVICE

We can maintain your system to ensure it keeps working at its most efficient throughout its life cycle, as well as provide you with relevant advice.

#### TRAIN

We advise through all phases of the process. We offer seminars, some of which are CPD accredited, both face to face and by webinars.

#### COLT LOOKS AT THE COMPLETE PICTURE

Colt is able to apply its extensive knowledge of how a building works and its expertise in a broad range of technologies – from natural ventilation to evaporative cooling, from HVAC and mechanical ventilation to industrial heating – in order to design a custom solution that takes into consideration all these factors.

Colt can also bring to the project its unique expertise across different specialties, so that its climate control solutions can be integrated with solar shading and smoke control systems.



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