



Louvre

Screening & Ventilation



Introduction



Front cover image

One London Wall, London.

Colt provided an elliptical plant room louvre screen for this prestigious commercial office development designed by Foster & Partners. The Main Contractor was Sir Robert McAlpine.

C-Plex, West Bromwich.

Trapezoidal ZUL louvre panels.

INTRODUCTION

Louvre systems are popular with designers for many applications in industrial and commercial buildings. Their purpose can be to control light entry, to provide ventilation whilst maintaining rain defence, to provide screening, or a combination of these. They can also be provided simply for aesthetic impact.

This brochure describes Colt's range of screening, ventilation and rain defence louvre systems, as well as acoustic louvres.



FEATURES & BENEFITS

- **Aesthetically pleasing.** Colt louvre systems have a distinctive sharp louvre profile.
- **Reduced energy costs.** Colt louvre systems are highly aerodynamically efficient. This reduced air resistance allows the plant and the aperture to be smaller thereby saving running costs.
- **Enhanced performance.** Colt louvre systems are both aerodynamically efficient and have a remarkably high resistance to weather.
- **Proven performance.** All Colt louvre systems have been tested to EN 13030:2001.
- **Easy to install.** Colt louvre systems can be either be delivered to site pre-assembled or as a kit of parts.
- **A wide range.** Colt louvre systems are available in various shapes, configurations, materials, finishes and coatings to meet the requirements of almost any project.

Louvres can be extruded or roll-formed; polyester powder painted, pre-coated or anodised, perforated, or stucco embossed.

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.

There are also a wide range of accessories, including single skin or insulated blanking panels, acoustic modules, guards and meshes, doors and turrets.

- **Upgradeable louvre.** Colt can upgrade "live" areas to double or triple bank configurations at a later stage than the installation. Please see page 7 for more details.
- **Design input provided by Colt.** Colt louvre systems can be uniquely configured to provide the solution to your needs. Software programs are freely available to assist with this. It's easy to size a panel according to a maximum pressure drop, or to specify the appropriate louvre bank configuration based on a set flow rate and maximum pressure drop.

With Colt louvre systems, the possibilities are endless.

COLT LOUVRE SYSTEMS

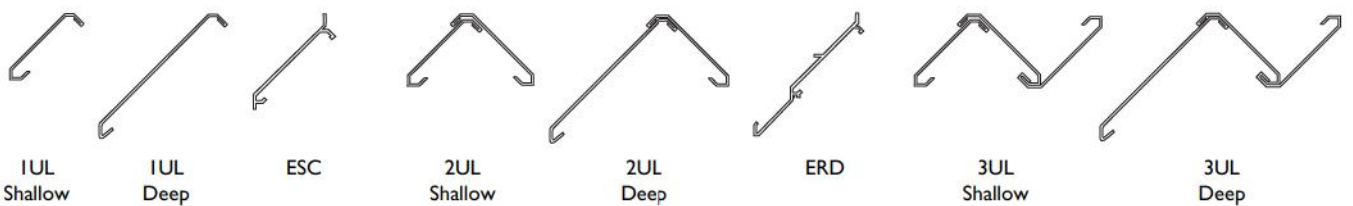
Colt offers two generic types of louvre systems:

Screening Louvre: Single Bank Universal roll formed Louvre and extruded 'E' Series ESC Louvre.

Ventilation and Rain Defence Louvre: Double and Triple Bank Universal roll formed Louvre, and 'E' Series ERD, a Single Bank extruded rain defence Louvre.



*Portway School, Bristol
Pre-assembled 3UL louvre turrets
on top of natural vent shafts.*



Technical Standards

INTRODUCTION

Specifying louvre is always a compromise, and requires some judgement to take into account the particular needs of each application. At one end of the scale for example a car park may require maximum ventilation but little protection from rain penetration. Alternatively, a plant room containing special machinery or electrical equipment may still need high levels of ventilation but with maximum protection from water entry.

The ideal design solution is to produce a louvre system that offers the best RAIN DEFENCE and AERODYNAMIC PERFORMANCE. Unfortunately this seems to be unachievable. But nothing matches the overall performance standards set by the Colt Universal Louvre range.

BACKGROUND

There has been a problem for many years in quantifying the performance of louvre systems due to the competing test standards and lack of application guidance for designers.

The European Standard EN 13030:2001 “Ventilation for buildings – Terminals – Performance testing of louvres subjected to simulated rain” helps by providing a useful classification method. However, the responsibility for recommending classifications for particular applications still remains with the designer or specifier.

This guide is therefore intended to assist designers and specifiers to select the most appropriate louvre performance classification to suit each specific application.

CONSIDERATIONS

Site location and **exposure**
Severity of local (site) **weather conditions**
Location and exposure of louvres on building
Airflow rate and direction through louvre
Maximum acceptable **pressure drop**
Degree and **depth of water penetration**
acceptable
Special solutions for sloping applications

EN 13030:2001 AND EQUIVALENT STANDARDS

British manufacturers of louvre systems in conjunction with HEVAC and BSRIA developed a test and classification method to help designers differentiate between alternative louvre systems to suit specific applications. The HEVAC standard formed the basis for the European standard EN 13030, which is technically identical.

BS EN 13030 Test Results

Rain Defence Classification	Effectiveness (1.0 = 100%)	Rain Defence Effectiveness (%)	Actual Rain Entry Rate (litres/hr/m ² louvre)
Class A	1.00	100%	0.00
	0.99	99%	0.75
Class B	0.989	98%	1.50
	0.95	95%	3.75
Class C	0.949	90%	7.50
	0.80	80%	15.0
Class D	below 0.80	70%	22.5
		60%	30.0
		50%	37.5

Aerodynamic Performance

Class	Coefficient
Class 1	0.40 and above
Class 2	0.30 to 0.399
Class 3	0.20 to 0.299
Class 4	below 0.20

To help put the performance classifications into perspective the table above shows how “effectiveness” relates to actual rain entry under standard test conditions, which are representative of bad Northern European weather. The effectiveness classification should be specified for the design air inlet velocity through the louvre since it is velocity dependent.

A high coefficient means low resistance and high airflow performance.

The test environment in the standard, at 13m/s (30mph) wind speed and 75mm/h (3 inches/h) for a period of 30 to 60 minutes, is intended to represent bad Northern European weather conditions. Two performance classifications are provided, one for rain defence and one for aerodynamic performance.

However it is worth noting that this test is based on louvre panels of only 1m x 1m in size. Whilst being very useful in allowing direct performance comparisons for louvres with different designs, it cannot accurately replicate the need for water collection and drainage needed where large louvre panels are installed.

Unlike other louvre types, Colt 2UL and 3UL panels have efficient drainage paths into their hollow section mullions, which in practice further increases their rain defence effectiveness.

The principles of EN 13030 are replicated in the USA under the AMCA Standard 500-L, "Laboratory Methods of Testing Louvers for Rating", and in Australia / New Zealand in AS/NZS 4740:2000: "Natural ventilators - Classification and performance".

APPLICATIONS

Recommendations for the selection of rain defence louvres, based on actual design inlet air velocities (for exhaust louvres take a velocity of 0 m/s, representing the worst case with the exhaust system switched off):

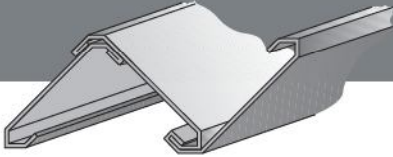
Class A	Where excellent rain defence is required and core velocities are above 1m/s and up to 3.5m/s.
Solution 3 UL No appreciable water penetration	
Class A	Where excellent rain defence is required and core velocities are up to 1m/s.
Solution 2 UL No appreciable water penetration	
Class B	Where good rain defence is required and core velocities are between 1m/s and 2.2m/s.
Solution 2 UL Some water entry but limited depth of penetration	
Class B	Where good rain defence is required and core velocities are up to 1.5m/s.
Solution E Series ERD Some water entry	
Class C	Where reasonably good rain defence is of benefit and core velocities are between 2.2m/s and 3.5m/s.
Solution 2 UL Significant water entry but limited depth of penetration	
Class C	Where reasonably good rain defence is of benefit and core velocities are between 1.5m/s and 2.3m/s.
Solution E Series ERD Some water entry	
Class D	Where maximum airflow is required but rain defence is not considered important.
Solution 1 UL Only limited protection from wind driven rain	
Class D	Where maximum airflow is required but rain defence is not considered important.
Solution E Series ESC Only limited protection from wind driven rain	

CLASSIFICATIONS FOR COLT LOUVRE SYSTEMS

3 UL (Triple Bank)	Class A3 up to 3.5m/s
2 UL (Double Bank)	Class A2 up to 1.0 m/s Class B2 from 1.0m/s to 2.2 m/s Class C2 from 2.2m/s to 3.5 m/s
ERD (Single Bank)	Class A2 at 0m/s Class B2 up to 1.5 m/s Class C2 from 1.5m/s to 2.3 m/s Class D2 from 2.3m/s to 3.5 m/s
1 UL (Single Bank)	Class D1 all velocities
ESC (Single Bank)	Class D1 all velocities

Performance specifications should always include the design air inlet (core) velocity.

Ventilation & Rain Defence Louvre - 3UL



TRIPLE BANK UNIVERSAL LOUVRE

Its consistent appearance and installation flexibility makes the Triple Bank Universal Louvre ideal for screening and cladding applications requiring ventilation with maximum rain defence. Triple Bank Universal Louvre, 3UL (three louvres deep) has two front louvre profiles:

- Shallow (50mm pitch) and
- Deep (100mm pitch) Front louvre only

3UL also has two arrangements:

- Horizontal and Vertical



Western Harbour Tunnel, Hong Kong.
Triple bank faceted circular louvre installed to handle the high air volumes required and to provide maximum rain protection even in typhoon conditions.

FINISHING OPTIONS

There are three standard material options for the principal components:

- Aluminium
- Mild Steel and
- Stainless Steel (50mm pitch only)

There are many decorative finish options, including:

- Mill Finish
- Stoved Polyester Powder Paint and
- Anodised

Perforated, Stucco and Pre-Coated louvres (normally applied to front louvres blades and frames only) are also available on request.

The applied finishes can be supplied in two coverage levels:

- Total (all principal components)
- Partial (louvres and frames only)

OPTIONAL EXTRAS

There are a large selection of optional accessories such as:

- Mitred Corners
- Blanking Panels (Single Skin or Insulated)
- Special Shapes
- Acoustic Modules
- Guards (Bird / Insect* / Security)
- Doors
- Turrets

* Insect mesh will result in reduced airflow and additional resistance.



Indoor Recreation Centre, Ma On Shan, Hong Kong.
Universal Louvre for plant room ventilation and for controllable air inlet for the smoke extraction system.



The Light, Leeds.
Single bank 1UL louvre upgraded to 3UL for "live" areas.

PERFORMANCE SPECIFICATION

A multi purpose louvre system shall be provided to achieve minimum resistance to airflow, with louvre blades to be aerodynamically shaped with no sharp edges or protrusions, to ensure the highest efficiency airflow performance.

Airflow

The following minimum aerodynamic coefficients shall be achieved when the louvre panel is tested to EN 13030:2001:

Air Inlet - 0.277
Air Extract - 0.22

Rain defence

The louvre system will achieve the following weathering classification when the louvre panel is tested to EN 13030:2001:

Class A3 - up to 3.5m/s suction velocity

The louvre system shall be drained internally through hollow section vertical mullions which shall discharge water onto the cill.

The louvre system shall be capable of combining both double bank functional louvre and single bank aesthetic louvre with rear blanking panels on the same elevation without variation in external profile.

PRODUCT SPECIFICATION

Colt Triple Bank Universal Louvre type 3UL having louvre blades at 50mm pitch (shallow section) or 100mm pitch (deep section, front louvres only).

Construction throughout shall be from high quality corrosion resistant aluminium alloy type 3005 (Colterra) or 3105 to BS 1470.

Front louvre blades shall not be drilled but clipped and not rivetted or screwed to structural supporting mullions allowing for expansion and contraction along their length without distortion and to provide a continuous external appearance if required.

Mullions shall be concealed at 1250mm maximum centres and their points of support along their length shall be in accordance with prevailing site wind pressures (as calculated and specified by a structural engineer) in accordance with BS 6399 part 2. Manufactured from 2mm sheet such that associated support steelwork is reduced to a minimum.

Cill and frames shall contain all peripheral fixings and be manufactured from 1.6mm sheet.

PERFORMANCE SUMMARY

- Good airflow properties
- Excellent rain defence properties

Suited to applications requiring architectural screening or cladding with excellent rain defence protection even with high air intake velocities.



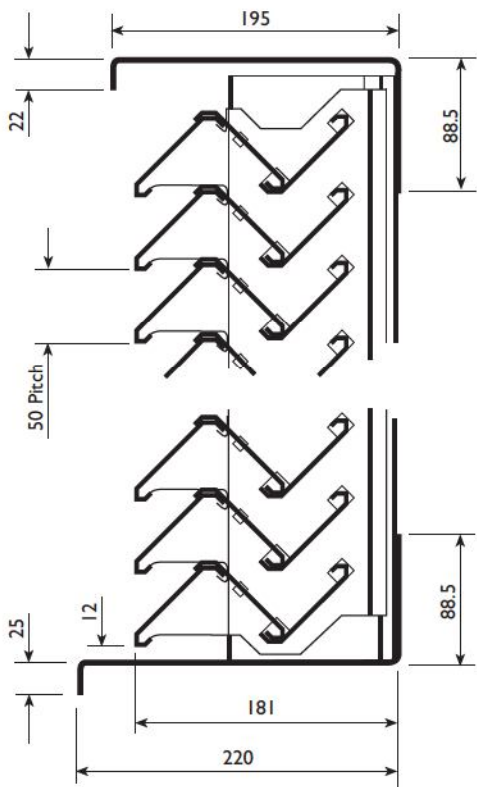
Turbine Surface Technologies, Nottingham, UK.
Customer comment:
"Colt was the only company capable of handling a combined package of natural extract ventilation, solar shading louvre and screening & ventilation louvre".

Ventilation & Rain Defence Louvre - 3UL

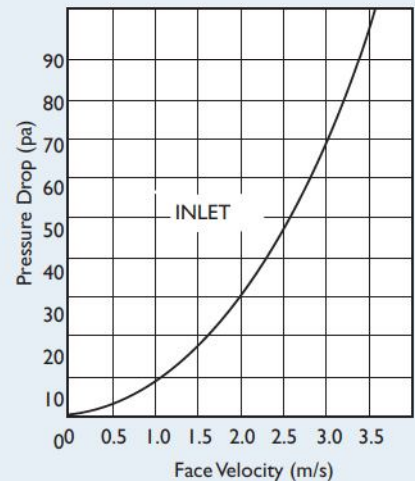
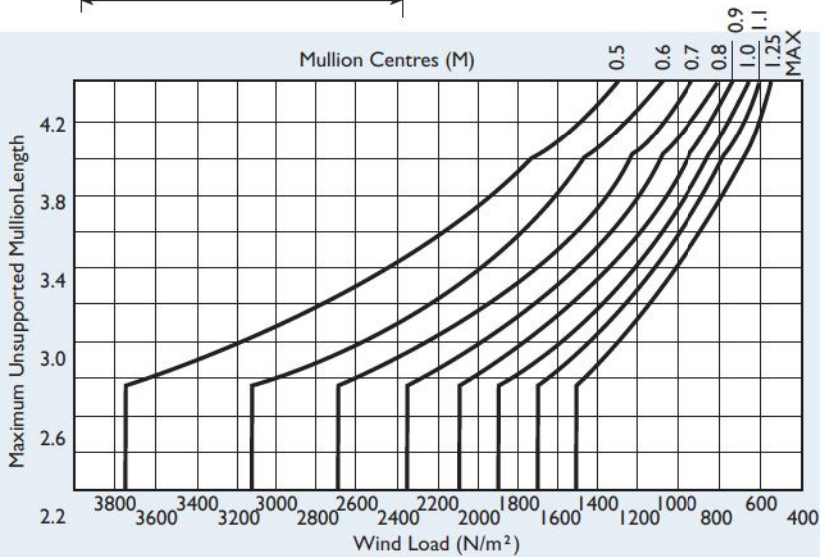
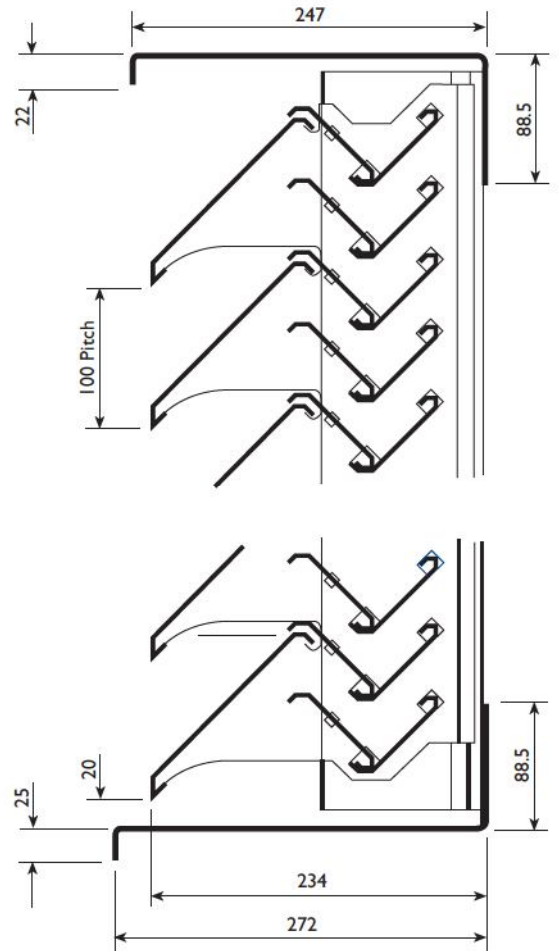
Dimensions

Note: All dimensions are given as internal, external dimensions will vary depending upon material thickness

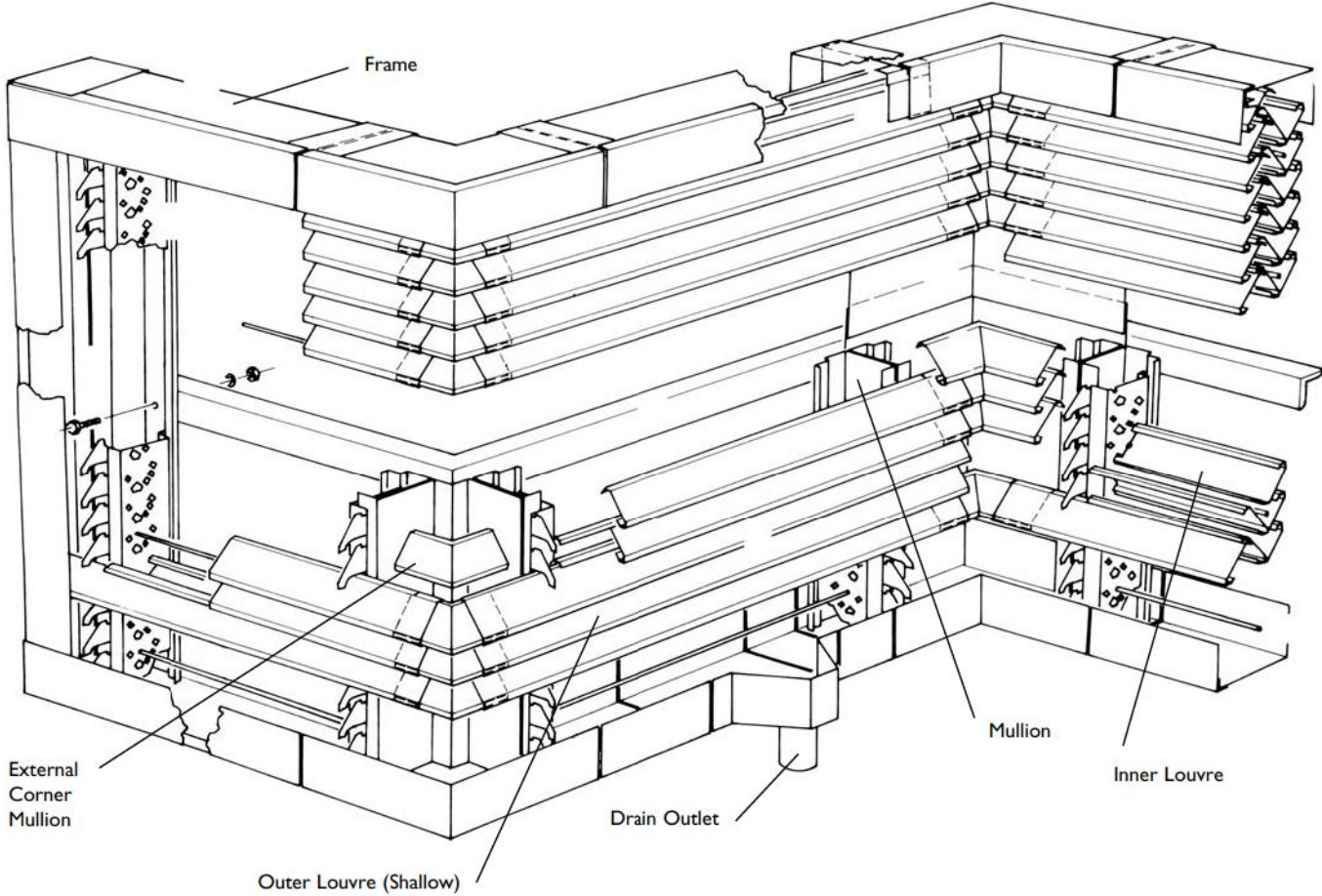
Shallow section



Deep section



Assembly



WIND SPEED CONDITIONS

