

Labyrinth

Light-Weight Natural Ventilator



Labyrinth is manufactured under license from Colt International, UK

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Labyrinth Product Details

STANDARD FEATURES

- Aluminum Construction
- Lightweight – good for hoisting and installation
- Low profile – lessens impact of the wind on the roof
- Assembly on Ground or In-Place
- Compact Shipping

OPTIONAL FEATURES

- Paint to color match in various material coatings
- Optional materials of construction available
- Birdscreen

BENEFITS

- Uses no energy
- No maintenance
- Silent operation
- Zero operational cost
- Long life span
- Architecturally pleasing
- Minimal impact to building, limited structural work necessary

APPLICATIONS

- | | | |
|---------------------|----------------------|----------------------|
| • Aluminum industry | • Rolling mills | • Waste incinerators |
| • Power stations | • Welding facilities | • Process industry |
| • Glass industry | • Warehouses | • Foundries |
| | • Steel industry | • Storage area |

PRODUCT DESCRIPTION

Labyrinth is a natural louvered exhaust ventilator. It has aerodynamically designed louvers & baffles to provide continuous weatherproof ventilation. Labyrinth is compact and designed for ridge mount, slope mount, or flat roof mounting conditions. Rainwater is collected within the ventilator and drained away via side channels to keep the opening free of water entry. The aluminum construction and low profile design reduce loading impact to the building. Through testing, the Labyrinth guarantees proper performances and weather tightness.

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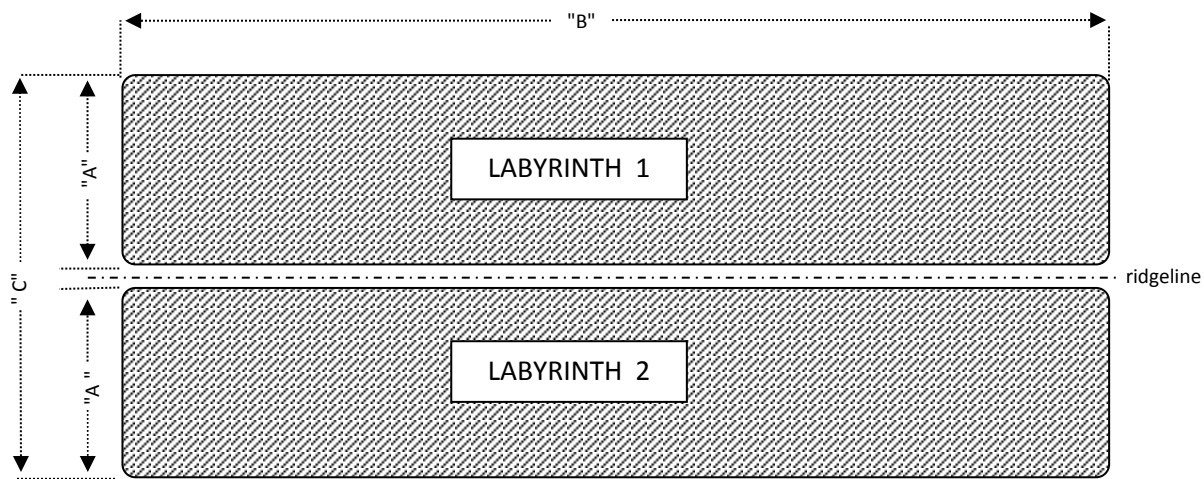
The diagram illustrates a cross-section of a labyrinth vent assembly. A central rectangular area is labeled "LABYRINTH" and is filled with a diagonal hatching pattern. Above this area, there are two horizontal dashed lines with arrows at both ends. The top line is labeled "(B) LENGTH OF VENT". The bottom line is labeled "ROOF OPENING (VENT LENGTH MINUS 2")". To the left of the labyrinth, there are two vertical dashed lines with arrows at both ends. The top line is labeled "VENT WIDTH". The bottom line is labeled "VENT WIDTH MINUS 3 1/2"". Below the labyrinth, there are two vertical dashed lines with arrows at both ends. The top line is labeled "A" with a double-headed arrow. The bottom line is labeled "OPENING WIDTH".

The diagram illustrates the components of the labyrinth ventilator system. A central rectangular box is labeled "LABYRINTH VENTILATOR". Above this box, a horizontal double-headed arrow indicates the "(A) WIDTH". Below the box, the system is supported by a "BASE SUPPORT" on the left and a "ROOF DECK" on the right. The "BASE SUPPORT" is shown as a vertical post with a horizontal base. The "ROOF DECK" is shown as a horizontal surface with a vertical post. Below the roof deck, a "ROOF PURLINE" is indicated. The entire system is mounted on a "BUILDING STRUCTURE", which is shown as a series of horizontal lines at the bottom.

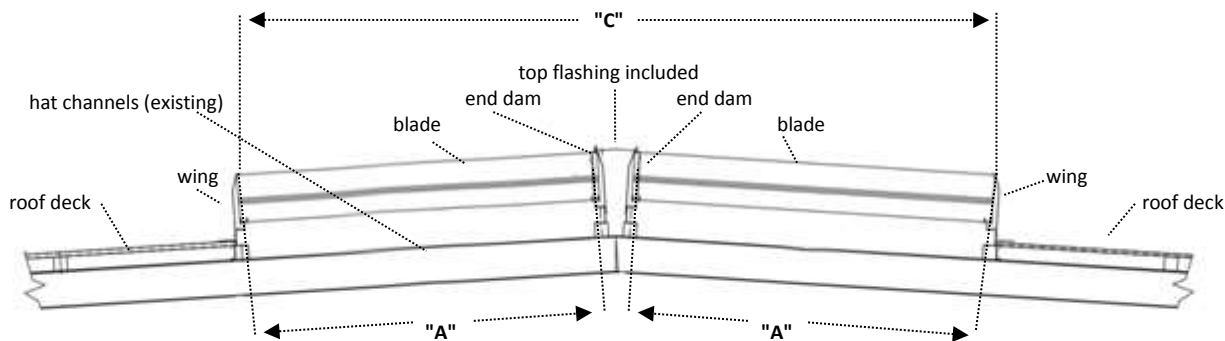
MARK	NUMBER OF RUNS	(A) VENT WIDTH	(B) VENT LENGTH	MOUNTING CONDITION (Flat, Slope or Ridge)

CONSTRUCTION: ALUMINUM, MILL FINISH
COUNTER FLASHING: ALUMINUM, OPTIONAL
SUPPORT BASE: ALUMINUM, INCLUDED

Labyrinth Double Width Mounting Info



Plan View



Section "A-A"

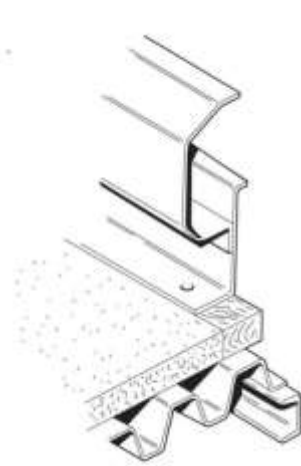
MARK	NUMBER OF RUNS	(A) VENT WIDTH	(B) VENT LENGTH	MOUNTING CONDITION (Flat, Slope or Ridge)

FEATURES

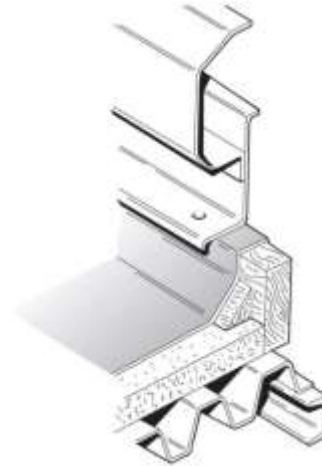
- CONSTRUCTION: ALUMINUM, MILL FINISH
- COUNTER FLASHING: ALUMINUM, OPTIONAL
- SUPPORT BASE: ALUMINUM, INCLUDED

Labyrinth Mounting Configurations

The Labyrinth can be installed directly onto a flat roof or onto a base support. It can also go on any shape of roof including flat, sloped, pitched, etc.



Base for installation onto flat roof



Base for installation onto base support



Labyrinth installed at an angle on a slanted roof.



Labyrinth installed flat onto roof curb on a slanted roof.

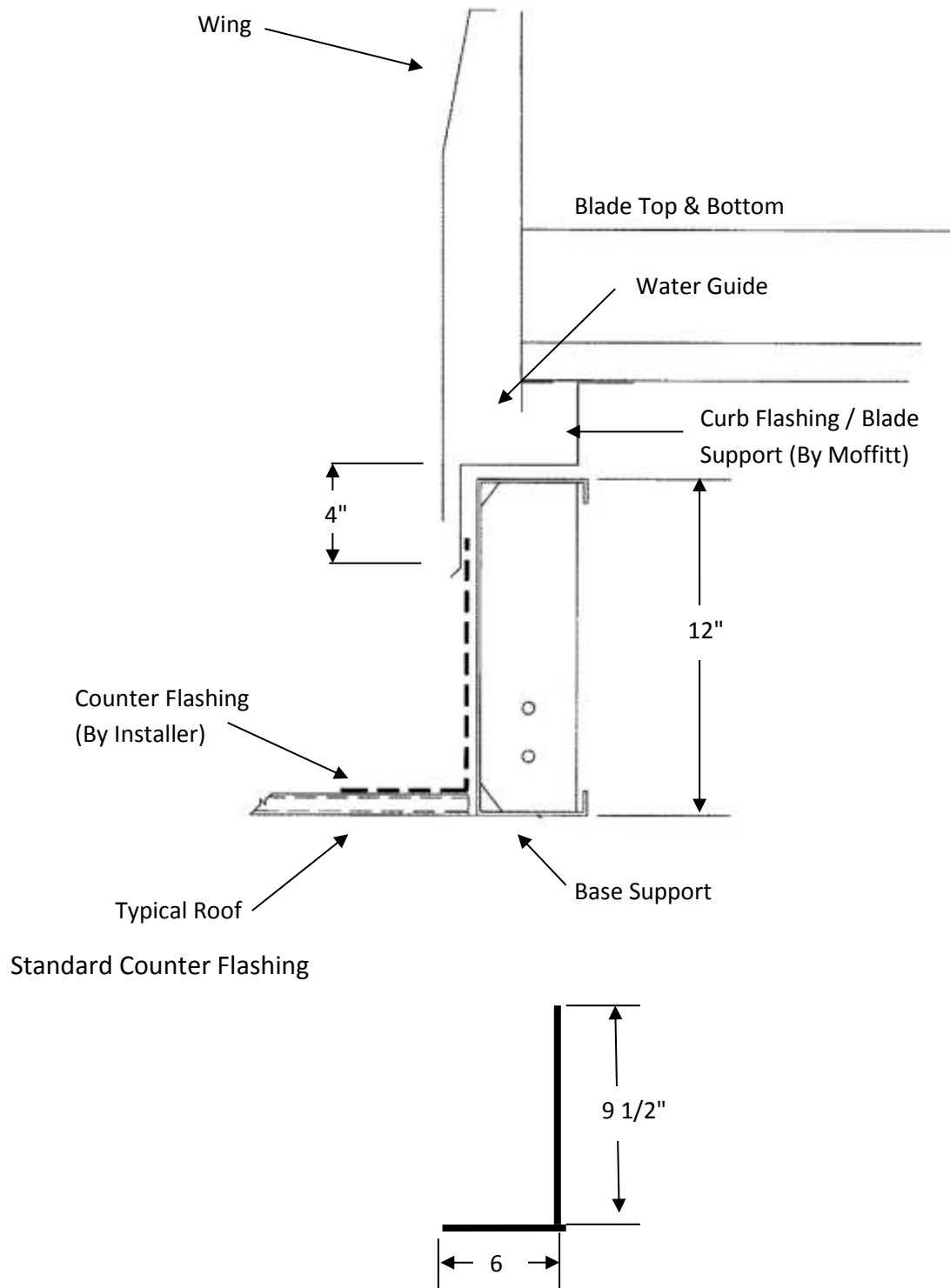


Labyrinth installed at an angle on a slanted roof.



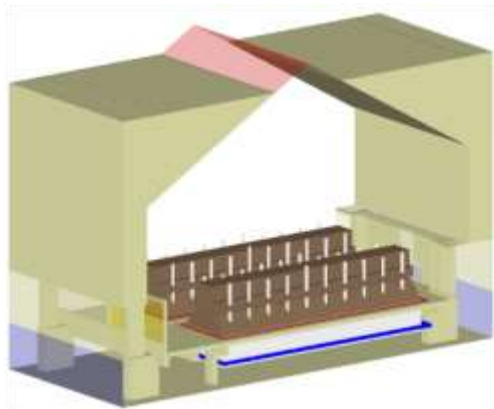
Labyrinth installed onto purlins, no roof curb.

Labyrinth Blade Cross Section

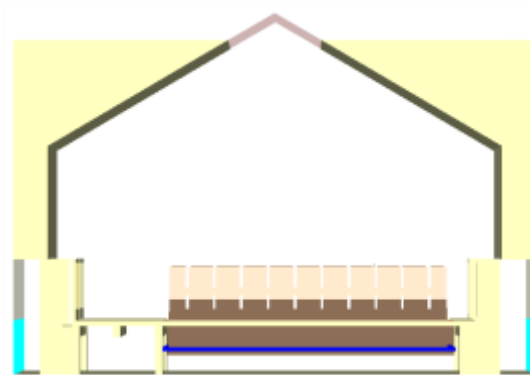


Labyrinth Computational Fluid Dynamics (CFD) Modeling

Computational Fluid Dynamics (CFD) predicts flows and transfer of energy within a building. Analyzing pressure relationships helps to better determine the size of the ventilation opening required and where it must be positioned. In addition, external factors such as wind load, wind direction and the position with respect to other buildings are included in the CFD model's calculations. The results of these calculations form the basis for designing the ideal natural ventilation system for the application.

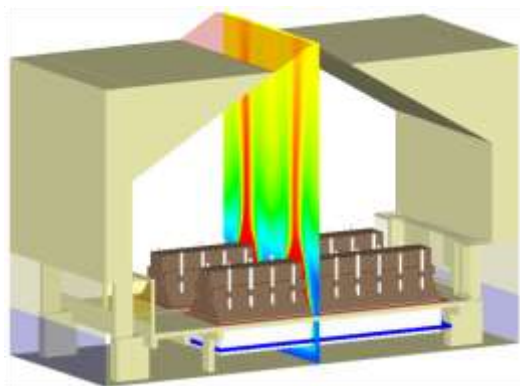


Base Model - longitudinal

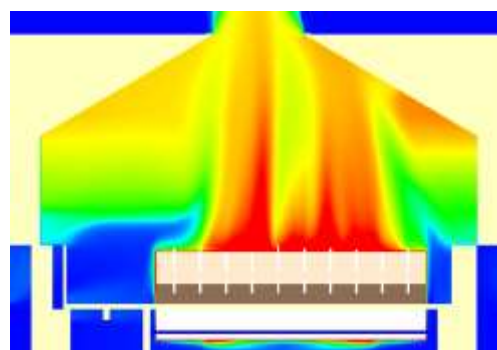


Base Model - Cross Section

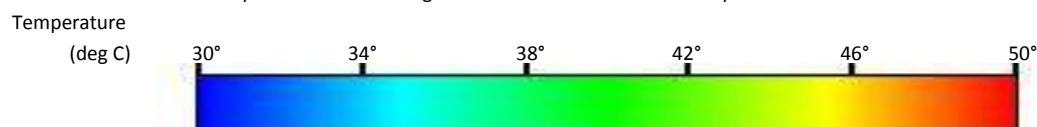
In this model of an industrial building, there is an intense amount of heat rising from the unit in the center of the building. By modeling the room, and looking at how the heat will rise, and in which direction, Moffitt can determine what the ideal ventilation system would be. In this case, the ideal solution is to have louvers on the walls to increase air flow, and a Labyrinth on the roof for the air to push the heat out through the building. With CFD, Moffitt was able to most efficiently and effectively remove the hot air from the facility.



Temperature Model - longitudinal



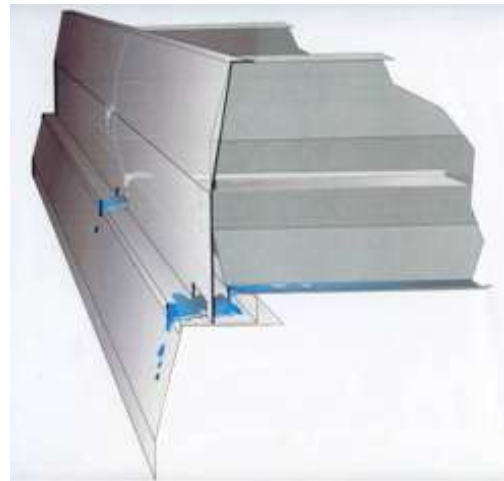
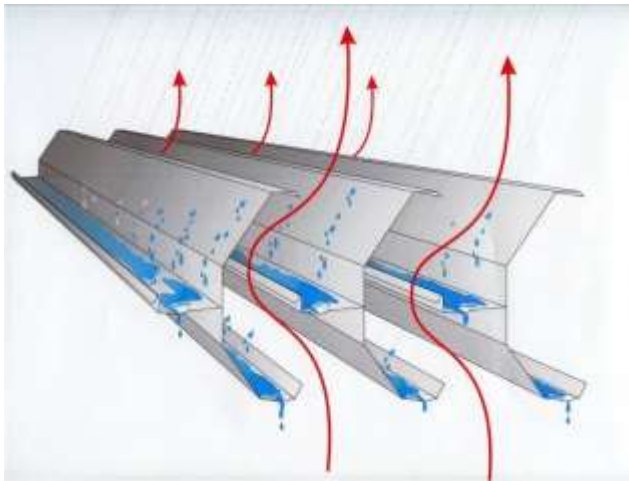
Temperature Model - Cross Section



Labyrinth Weatherproofing, Drainage and Natural Light

Labyrinth is a natural ventilation unit, developed to provide continuous, rainproof ventilation. The base of the unit houses a system of louvers that have been fitted such that 'labyrinth channels' are formed to catch the rainwater. The rainwater then drains to the roof via two channels.

Labyrinth is tested up to 7.87 in of rain per hour, with drainage systems in place every 14.56 in. Labyrinth helps ensure that the hot air goes out, the cool air comes in and the rain stays away.



An added benefit of installing the Labyrinth for natural ventilation is that it is also a highly effective natural light source.



Light from a non-Labyrinth unit
BEFORE



Light from a Labyrinth unit
AFTER

Labyrinth Assembly; Roof or Ground

Due to the lightweight construction and relative quickness of assembly the Labyrinth can be assembled either in place on a roof or on the ground and later hoisted up.



Ground assembly followed by lifting and roof installation



Labyrinth assembled directly on the roof of the facility

Labyrinth Pictures



Labyrinth Natural Ventilator Guide Specification

1.1. DESCRIPTION

Furnish and Install Labyrinth Low Profile Gravity Ventilators and accessories as indicated on drawings.

1.2. QUALITY ASSURANCE

MOFFITT (Jacksonville, FL, 1-800-474-3267) Products establish the standard of quality required. Manufacturer and erector shall demonstrate a minimum of five (5) years of related industry experience.

1.3. SUBSTITUTIONS

No substitutions will be considered unless written request for approval has been submitted by the bidder and has been received by the designer at least ten (10) days prior to bid date. Any proposed substitutions should meet the standards set by the specification.

1.4. SUBMITTALS

Furnish approval drawings prior to fabrication and erection drawings prior to shipment showing all erection procedures and accessories required for the specified product.

2.1. DESIGN

Labyrinth Low Profile Gravity Ventilators shall be designed to withstand a windward load of 120 MPH and a snow load of 45 lbs/ft² or a rain rate of 7.5 inches per hour. The coefficient of discharge value of the ventilator shall be not less than 0.22. The weight of the unit shall be 3.5lbs/ft².

2.2. MATERIALS

- 2.2.1. The Labyrinth shall be constructed 5052-H32 grade aluminum. All fasteners shall be stainless steel.
- 2.2.2. The Labyrinth profiles shall be capable of self-cleaning by action of the elements with provision for carrying water and normal wind transported soil to the outside of the ventilator.
- 2.2.3. The Labyrinth profiles will be shipped knocked down for field assembly by the erector with pre-punched connections for sheet metal fasteners and rivets.

2.3. OPTIONAL ACCESSORIES

- 2.3.1. Bird screen – ¾" x 0.50 expanded aluminum mesh, shipped in sheets for field installation
- 2.3.2. Paint – color to match, paint applied to wing exteriors only, interior of wings and labyrinth sections, mill finish.

3.1. INSPECTION

Examine alignment of structural steel prior to installation and do not proceed until structure is within tolerances established by AISC.

3.2. INSTALLATION AND ERECTION

Install Labyrinth Low Profile Gravity Ventilators and accessories in conformance with approved drawings and MOFFITT specifications.

3.3. DAMAGED MATERIAL

Repair or replace all damaged material.

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