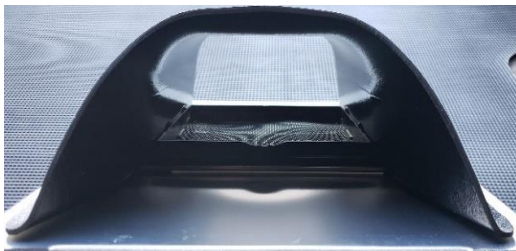




DRY-CON X® Crossflow Ventilation without Power

The 360 **DRY-CON X** ® is a patented venting system designed for applications without power. In this document we are using the spinning exhaust turbine as a comparison. It has been the only non-powered vent that drives airflow, until now. The turbine was invented in the 1920's, and it is still used all over this planet as a rooftop exhaust vent.

Our exhaust vent consists of a unique series of aerodynamic shapes, using the physics of fluid dynamics to generate low pressure at the port without moving parts.



2020's



1920's

Advantages of DRY-CON X®

- Works in all wind conditions, starting from less than ½ mph. The more turbulence and gusts, the greater the draw rate.
- In no-wind conditions, thermals and evening, cool falling air, create air flow.
- Wall mounted installation allowing versatile placement options.
- Easy fast install: Adheres with 3M® double sided tape, without screws or rivets.
- It cannot wear out, needs no maintenance or servicing. It vents 24/7.
- Installation of two exhaust vents costs less than the cost of one turbine installed.
- Two of our exhaust vents will outperform a 12" turbine.

Turbine Shortcomings

- If they don't spin, they don't move any air.
- A difficult install on container roofs
- Cannot be placed at floor level to vacate heavier than air hydrocarbon gasses.
- Sensitive to impact, dents which can prevent rotation, or allow rain to enter.
- Rotation can be stopped due to wedged objects, branches, cones, etc.
- Based on friction and mass; the design requires a minimum of 2-3 mph air speed to function. Turbines seldom pick up the potential gain from gusts, or turbulence. Bearings or bushings will wear out, causing noise, vibrations, and eventual failure.

Airflow Comparisons

Our tests compared a 12" turbine to our DRY-CON X®, calibrated from the intake port. This provides an accurate volume of air the exhaust is pulling into an enclosure. In winds over 3 mph the turbine draws almost 2 times more (not 10 times as per their advertised specs) than ours. The turbines do not pick up performance in radical gusts or turbulence, nor do they function in low winds or thermals. The 12" turbine has an opening size of approximately 112 sq in. Our DRY-CON X® exhaust port opening is 30 sq. in. To achieve repeated air exchanges, the consistency and volume of moving air is more important than the vent opening size.

Vent opening size

In off-grid situations the rule books and codes get a little fuzzy. In powered situations engineering specifications are applied with accurate cfm ratings and air handling systems are designed accordingly. Without power, these engineered requirements cannot work. It's a gray area for jurisdictions such as fire departments with safety concerns. Often there are recommendations for openings with a minimum of size of specified square inches, but nothing to do with air flow operating specifications. When passive vents such as louvers or hooded vents are used on their own, regardless how big the opening is, they will either allow blow in, possibly exhaust, or do nothing. There must be a driving exhaust force, then these passive vents become intakes.

Low Wind / No Wind Locations

The sunny side of a metal wall is a major heatsink, a great location for the “DRY-CON X®”. Those rising air currents last most of the daylight hours, drawing off the hot interior air almost continually. Then, reversing direction with the cooling evening air.

See Example 1 below:

Wind and Draw Rate Examples

The following two examples demonstrate the differences between the turbine and DRY-CON X designs (360). In Ex 1. the wind ranges throughout the day, from 0-3 mph winds. The 1.5 mph represents the average. The gusts and turbulence gains are difficult to determine for the turbine due its slow response time. The DRY-CON X immediately increases draw rate proportional to momentary wind speed increases. The following table consists of two wind scenarios where performance is compared over 24 hours.

24 hour exhaust examples of a 12" Turbine and the Dry-Con X									
1 day - 24 hr	Morning	Afternoon	Evening	Night	gusts	turbulence	Thermals	cooling	total cfm per day
6 hours	360 min	360 min	360 min	360 min	360 min	360 min	360 min	360 min	
example 1									
wind range: avg	0-3 m 1.5	5-10 mph=7.5	3-5 mph=4	0-3 mph=1.5	3 mph	3 mph	2 mph	2 mph	
turbine @ 8ft/m	0	21,600	11520	0	0	0	0	0	33,120
360 @ 4ft/m	2160	10800	5760	2160	4320	4320	2880	2880	35,280
example 2									
wind range: avg	1	12	5	5	5	5	1	0	
turbine @ 8ft/m	0	34560	14400	14400	4500 = .5	4500 = .5	0	0	64,080
360 @ 4ft/m	1440	17280	7200	7200	7200	7200	1440		48,960

Vents Installation

The roof top installation of the turbine is complex. There are several different corrugated roof profiles. Pooling water and leaks are common. By comparison, the DRY-CON X® exhaust installation is fool-proof and easily mounted without rivets or screws. View the installation video at <https://youtu.be/i5VGVontXP0>.

On a 40 ft shipping container we recommend two of our exhaust vents and two intakes. On a 20 ft container, one exhaust and one intake is usually sufficient. Always keep in mind what is being stored. For anything with hydrocarbons such as lawn mowers, chain saws, paints, oils, etc., we highly recommend at least one exhaust at floor level.

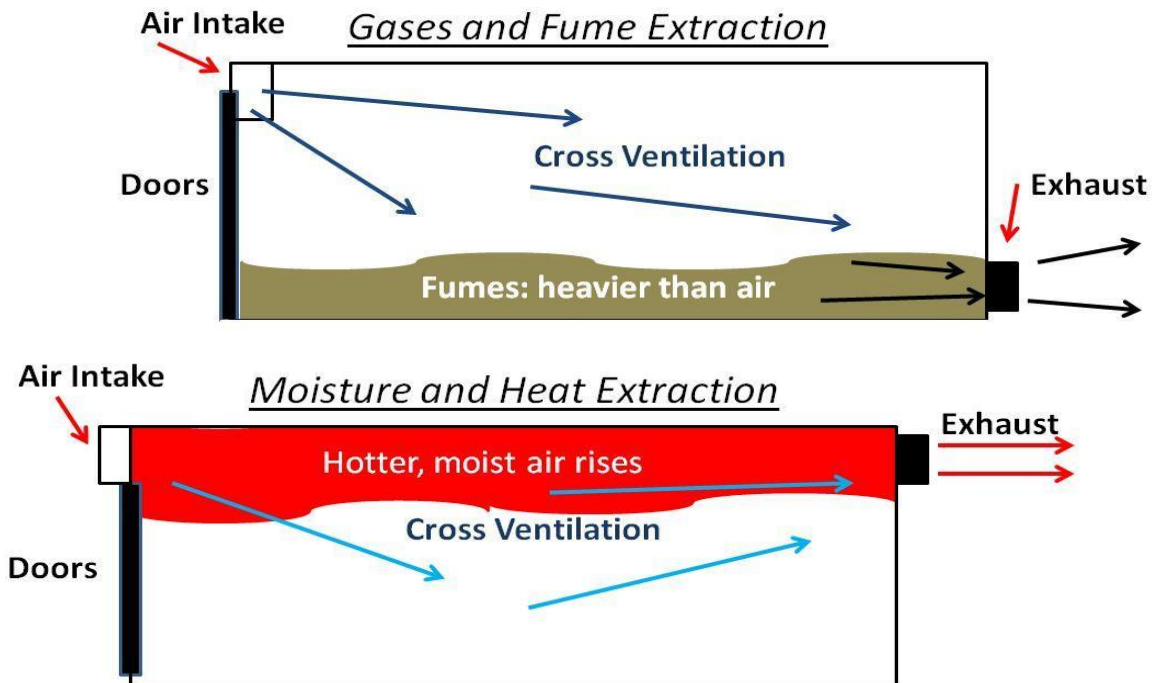
Intake Vents



Exhaust Vent Location

Intake installation must be at the opposite end of the enclosure from the exhaust. We recommend positioning high on the enclosure, not the bottom. This provides less possibility of drawing in ground moisture, machine exhaust, fumes, or airborne particulate such as ash, pollen, smoke, etc. The DRY-CON X[®] hooded intake vent has less chance of pulling in mist compared to louvers. Rain splashing on the louvers can create mist, that can be drawn inside. Our testing shows that an intake screen area should be similar in size to the exhaust vent screen area.

Location of an exhaust vent is crucial for what's being stored. Having an exhaust vent on the ceiling when storing gas-powered machines or fuel is almost useless. Always install exhausts at floor level for fumes and up high to pull out heat and moisture.



Depending on what is being stored, install either of the above. If heat and fumes are to be exhausted, place one exhaust up and one down on the same wall.

Recommendations

The 360 Products DRY-CON X® is an innovative, highly effective solution for venting in a non-powered environment. Our patented 360 Products have been installed worldwide in a wide variety of environments. View the full range of venting solutions at <https://360productsnorthamerica.com/>.