Low Wind Situations and Air Exchange Tables

The following is for condensation control and heat extraction

On-site wind speed and duration will determine how many vents you need. Spend time around the site, try to assess the air movement, direction, speed and an average duration. The following wind speed descriptions might be helpful in determining if there is sufficient air movement for the "Wall Exhaust" to properly ventilate.

1-3 mph: barely noticeable (3mph walking speed); not ideal for natural ventilation, power might be required.

4-6 mph: a light breeze; should be effective for eliminating condensation in most cases

7-9 mph: a little windy; One "Wall Exhaust will be moving over 20,000 – 26,000 cu ft/ day. Effective.

10-12 mph: white caps form on the water, it's windy! No reason for power, we have serious air flow!

The link below will give you the historical wind conditions for your general area, but the actual winds at the site will be different. https://www.wunderground.com/history/

Light Wind Conditions: We cannot say for sure if 3 or 4 mph for half the day is enough or not. To date 5 mph conditions and more have worked for our customers. We have not heard anything on the contrary. Please note, there are numerous contributing factors that cause condensation. That is why we recommend as many things you can do as listed in the **"8 steps to a dry container"** to give the lower air exchanges a chance to work for you. If the area is in that border zone of 3-4 mph for only a couple hours, the following options are available.

- Insulate the ceiling. Preferably with the spray-on closed cell foam
- Bring in power to run a fan or dehumidifier. (dehumidifiers are preferred in the hot humid regions)
- If a fan is chosen, intake and exhaust ports are still required. In that case you could try our ventilation system first, and if the results are not adequate, then place a low powered fan behind the "Wall Exhaust"

Unpredictable Wind Directions: If you don't have a prevailing wind direction, or the conex is often relocated, the intake vent can be replaced with an Exhaust vent. Numerous customers have had great success the 2 Exhaust on either end of a 40 footer.

Air Exchange Rates: The following examples are based on our "**360 Wall Exhaust"** draw rate of 4 cu. ft / min/1 mph of wind. The calculations are simple; higher wind speed or duration the more internal air is replaced per day. Add an extra Exhaust vent and that number doubles. More complete air exchanges the better. Due to so many variables regarding condensation, there in no one magic number. To date there has been success above 10 air exchanges per day, obviously, higher the better. The following numbers do not include the extra draw rate created from wind turbulence and thermals (especially when the exhaust vent is on a sunny wall).

Container size	Wind Speed	Exhaust Vents	Intake Vents	Exhausted air (cu ft / day) with12 hrs of wind	Completed air exchanges / day
20' container	3 mph	1	1	8640	6.6
20' container	3 mph	2	1	17280	13
20' container	5 mph	1	1	14400	11
40' container	5 mph	2	1	28800	11
40' container	5 mph	3	2	43200	16.6
40' container	8 mph	2	1	46080	17.7
53' High cube	8 mph	3	2	69120	17.7

The low exchange rates above are not recommendations, only examples. We suggest the upper teens and better.

Why replace the interior air with the humid air from outside? The dew point is the temperature where the moisture in the air will condense on a surface. A metal ceiling will obviously allow condensation on its surface much easier than Styrofoam. The most important variable is the temperature difference of the inside virses the outside. Closer those temperatures are the better. After a day in sun the inside is going to be much hotter than outside, even more so when the sun goes down. Same in the morning with a colder interior compared to the early morning sun. By keeping the temperatures similar you have reduced the chance of condensation forming.