

REFRIGERATION REVIEW

Dock Levelers

We have talked about how dock levelers affect infiltration. Infiltration is a topic which comes up frequently, and we have talked about it before. It takes approximately 1000 BTU/pound to remove a pound of water from the air. So, when you address the problem of infiltration of outside air, your very first line of defense are truck doors. How you address truck doors can have a long term effect on not just the refrigeration system, but also the interior surfaces of the dock. Everyone wants to make a tight fit for the trucks, and some promote the use of trucks backing into the building where their doors open inside the dock area. Whether you choose that technology or other technologies like vertical levelers, every effort should be made to reduce humid air entering the dock area.

Opposite of what you would think, humid air is *lighter* than dry air. When moisture molecules displace air, they are displacing heavier molecules with lighter molecules. Air consists of diatomic molecules of Oxygen and Nitrogen, with an average atomic weight of about 30. Water (H₂O) has an average atomic weight of about 18, so humid air -- especially warm, less dense air -- would want to enter the truck doors at the top of the door while the cooler, heavier air would want to convect out of the bottom of the door.

This brings up the advantage of high-ceiling docks (25' to 30'), which provides more room for moist air to mix with dry air before it comes in contact with the steel of the roof framing system and the metal deck, which is normally exposed.

Over the years, I have seen low docks (14' to 16') whose ceilings became totally blackened from the moisture that had condensed on the surface. On the other

hand, I have seen 30' ceilings that are totally void of mold after 30 years of operation. Of course, how the air is moved and treated on the dock makes a difference. We would customarily use reheat to help control the humidity and make an effort to keep infiltrate air above the dew point of the room's interior surfaces.

Back in the days of dock pits, Sysco had a rule of thumb that you had to maintain the dock at 45° or above to keep the dock pit leveler from sweating. Of course, pits are almost impossible to prevent infiltrate air from moving in and letting cold air go out.

It is well to note that the cost to remove moisture on a dock is far more affordable than letting the moisture get to and through the freezer doors. So, word to the wise: Keep infiltration at a minimum coming in the doorways.

The most popular way to keep infiltration to a minimum is to use vertical levelers and doors which are customarily 7'-6" wide by 8'-6" high. When the levelers are in the "up" positions the doors can fit tightly in the recessed area and in addition are then protected from being damaged by materials handling equipment by the vertical levelers.

Below are examples of vertical levelers and tight-fitting dock doors that help with infiltration of outside air.



